

AD-A285 037



COST/SCHEDULE CONTROL SYSTEMS CRITERIA
INTERPRETATION DIFFERENCES BETWEEN THE
DOD AND ITS CONTRACTORS

THESIS

Captain Brian E. Hoffmann, II
Captain Johnny Wilson

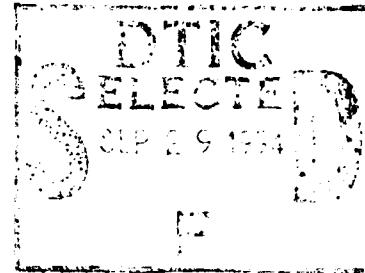
AFIT/GSM/LAS/94-S-6

This document has been approved
for public release and sale; its
distribution is unlimited.

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY
AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

AFIT/GSM/LAS/94-S-6



COST/SCHEDULE CONTROL SYSTEMS CRITERIA
INTERPRETATION DIFFERENCES BETWEEN THE
DOD AND ITS CONTRACTORS

THESIS

Captain Brian E. Hoffmann, II
Captain Johnny Wilson

AFIT/GSM/LAS/94-S-6

Accession For	
NTIS CRAZI	
DTIC TAB	
Unannounced	
Justification	
By _____	
Distribution /	
Availability	
Dist	Aval. Spec.
A-1	

Approved for public release; distribution unlimited

DTIC QUALITY INSPECTED 3

24186 94-3111



24

S

24

**The views expressed in this thesis are those of the authors
and do not reflect the official policy or position of the
Department of Defense or the U.S. Government.**

**COST/SCHEDULE CONTROL SYSTEMS CRITERIA INTERPRETATION
DIFFERENCES BETWEEN THE DOD AND ITS CONTRACTORS**

THESIS

**Presented to the Faculty of the Graduate School of Logistics and Acquisition Management
of the Air Force Institute of Technology
Air Education and Training Command
In Partial Fulfillment of the
Requirements for the Degrees of
Master of Science in Systems Management and
Master of Science in Cost Analysis**

**Brian E. Hoffmann, II, BA
Captain, USAF**

**Johnny Wilson, MS
Captain, USAF**

September 1994

Approved for public release; distribution unlimited

ACKNOWLEDGMENTS

We both feel very fortunate for the support we received throughout our thesis experience. First of all, we would like to thank our advisors, Professor Dick Antolini and Dr. David Christensen. They provided us with the encouragement and direction we needed to see this project through. Additionally, Professor Antolini provided us with a unique perspective of how to converse with Department of Defense (DoD) and Industry personnel that we shall not soon forget.

We would like to extend our appreciation to all of those who participated in our research, providing us with comments and insight which made our work easier. We are grateful for the assistance provided by Mr. Bob Higbee, Loral Corp., Western Development Labs, in generating support for our project from the National Security Industrial Association. We appreciate the efforts of Mr. Wayne Abba, Office of the Undersecretary of Defense, for sponsoring this research. Thanks again to Cindy Douglas for giving us the administrative assistance when we needed it most.

Lastly, but certainly not least, we would like to thank the ladies of our lives whom supported us in this adventurous experience. Captain Hoffmann would like to thank Michele Spivak for being understanding and giving him many reasons to smile when the going got rough. Captain Wilson would like to thank his wife Tracie for believing in him and making the whole experience so much easier to bear.

Brian E. Hoffmann II

Johnny Wilson

Table of Contents

	<u>Page</u>
Acknowledgments	ii
List of Figures	v
List of Tables.....	vi
Acronyms.....	vii
Abstract.....	ix
I. Introduction	1-1
Specific Objective.....	1-2
Investigative Questions.....	1-3
Scope	1-3
Assumptions	1-3
Limitations	1-4
II. Literature Review	2-1
The Arthur D. Little Study	2-6
Joint DoD/Industry Total Quality Management (TQM) Team.....	2-7
Inspector General Audit Report on Use of Contractor C/SCSC Data	2-9
III. Methodology.....	3-1
Identify Problem Area and Initial Approach	3-1
Identify C/S Focal Points and Assign Sections of Interpretive Guide for Review	3-3
Prepare Packages for Mail-out to Research Participants.....	3-6
Perform Follow-up with Research Participants.....	3-8
Collect and Sort Responses from Participants.....	3-9
Perform Analysis of Data Collected	3-11
Summarize Findings	3-11
IV. Analysis	4-1
Organization	4-2
Planning and Budgeting	4-6
Accounting	4-11
Analysis	4-13
Revisions	4-18
Additional Questions	4-21

	<u>Page</u>
V. Conclusions and Recommendations	5-1
Systems Acquisition Implications of C/SCSC	5-1
Corps of Competent Analysts	5-2
Streamlining of Variance Reporting	5-3
Evaluation of the Interpretive Guide.....	5-3
Recommendations.....	5-4
Further Research.....	5-6
Closing Comments.....	5-7
Appendix A Interpretive Guide Responses.....	A-1
Appendix B Responses to Additional Questions.....	B-1
Appendix C Glossary of C/SCSC Terms	C-1
Appendix D Sample JIG Checklist Page.....	D-1
Appendix E Research Package Cover Letter.....	E-1
Appendix F Research Package Instructions.....	F-1
Appendix G Acknowledgements of Participants	G-1
Bibliography	BIB-1
Vitae	VITA-1

LIST OF FIGURES

Figure		Page
2-1.	Five Major C/SCS Criteria Categories	2-3
3-1.	Methodology Flow Chart	3-2
3-2.	Components of Performance Management	3-3
3-3.	DoD Players in Performance Management.....	3-4

LIST OF TABLES

Table		Page
3-1	Number of Research Packages Mailed.....	3-6
3-2	Number of Research Package Responses Received.....	3-10
4-1	Number of Responses by Criteria Section.....	4-1

ACRONYMS

ACO	Administrative Contracting Office
ADL	Arthur D. Little (In reference to the Arthur D. Little C/SCSC Study)
AF	Air Force
AFIT	Air Force Institute of Technology
AFMC	Air Force Materiel Command
ASC	Aeronautical Systems Center
CAM	Cost Account Manager
CBB	Contract Budget Base
CEO	Chief Executive Officer
CPM	Contractor Program Manager
C/S	Cost/Schedule
C/SCSC	Cost/Schedule Control Systems Criteria
CWBS	Contract Work Breakdown Structure
DCAA	Defense Contracting Audit Agency
DCMC	Defense Contract Management Command
DoD	Department of Defense (U.S.)
DoDI	Department of Defense Instruction
DPRO	Defense Plant Representative Office
DSMC	Defense Systems Management College
EAC	Estimate At Completion
ESC	Electronic Systems Center
ETC	Estimate To Complete
HSC	Human Systems Center
IG	<i>Interpretative Guide to the Evaluation / Demonstration Review Checklist for C/SCSC (Appendix E, Joint Implementation Guide)</i>

IPT	Integrated Product Team
JIG	<i>Joint Implementation Guide</i>
LOE	Level Of Effort
MCS	Management Control System
MR	Management Reserve
MS-DOS	Microsoft Disk Operating System
NSIA	National Security Industrial Association
OBS	Organizational Breakdown Structure
OTB	Over Target Baseline
PC	Personal Computer
PMB	Performance Measurement Baseline
PMJEG	Performance Measurement Joint Executive Group
POC	Point Of Contact
RAM	Responsibility Assignment Matrix
RTF	Rich Text Format
SAR	Subsequent Application Review
SMC	Space and Missile Systems Center
SPO	System Program Office
TQM	Total Quality Management
TXT	Text File
UB	Undistributed Budget
VAR	Variance Analysis Report
WBS	Work Breakdown Structure

ABSTRACT

This study attempted to identify the major interpretive differences of the Cost/Schedule Control Systems Criteria (C/SCSC) between Department of Defense (DoD) and contractor performance management professionals, and to understand why these differences occurred. As the study progressed, its focus shifted to an evaluation of the *Interpretive Guide*, an Air Force Institute of Technology (AFIT) published document used to assist in the understanding of the criteria elements. The objective of the evaluation was to determine if the *Interpretive Guide*'s explanations of the criteria elements were in consonance with the intent of the criteria and with current practice in the field of performance management.

Data were collected by means of a research package which included the text of the *Interpretive Guide*, and a set of four open-ended questions which gave the respondents an opportunity to comment on the C/SCSC concept in general. Each potential respondent-group was assigned a specific area of the criteria to review (such as Organization, Planning and Budgeting) and each was also encouraged to respond to the additional questions. The population of interest consisted of Government personnel involved in the performance measurement discipline and Industry personnel affiliated with the National Security Industrial Association. The Industry personnel were significantly more responsive than the Government members receiving the research packages.

Based upon the responses received, three significant factors emerge regarding the *Interpretive Guide*. First, the *Interpretive Guide* and the criteria need to incorporate the concept of Integrated Product Teams (IPTs). As IPTs become an integral part of the contractors' Management Control Systems, reporting

relationships and areas of responsibility should be clearly defined. Second, the Government and Industry should develop procedures to streamline the area of variance analysis reporting. Summary level variance analysis reports would preclude the need for lower level reporting and shift the emphasis to those cost accounts which have significant deviations from mutually agreed upon thresholds. Finally, the *Interpretive Guide* needs to incorporate changes from the *Joint Implementation Guide* (JIG) which is currently undergoing a major revision.

Combined comments regarding the additional questions highlighted the need to have qualified and competent analysts and reviewers in the field. This would greatly enhance the quality of the ongoing Government reviews of contractor management control systems (MCSs). Additionally, it is imperative that the Government and contractor communities maintain open lines of communication to foster a better understanding of the various types of MCSs.

Recommendations include the updating of the *Interpretive Guide* to reflect the JIG revisions and the integrated product team (IPT) concept. Another recommendation is to conduct a joint Government/Industry forum to promote discussions of key areas of interpretive differences. Finally, an additional study should be undertaken to more thoroughly evaluate the Government's assessment of the content of the *Interpretive Guide* and the criteria in general.

COST/SCHEDULE CONTROL SYSTEMS CRITERIA INTERPRETATION DIFFERENCES BETWEEN THE DOD AND ITS CONTRACTORS

I. INTRODUCTION

This chapter introduces the topic of the thesis, provides the specific objective of the thesis and its supporting research questions.

Today's shrinking military budget finds the Department of Defense (DoD) being asked to do more with less. The decision to invest in a new or updated defense capability involves substantial cost risk to the government. Therefore, when DoD awards a major systems acquisition contract, it is imperative that the selected contractor has in place an adequate cost and schedule management control system which will provide timely, auditable, and reportable information. DoD Instruction 5000.2 applies to major system acquisitions and generally requires contractors to use management control systems meeting the Cost/Schedule Control Systems Criteria (C/SCSC) on major contracts (4:Pt 11 Sect B-2).

The C/SCSC mandated programs require contractors to demonstrate to government personnel that their cost and schedule management control system does comply with the criteria. However, because the criteria do not specify the "one best way" to define a contractor's management control system, problems frequently arise because of different interpretations of the criteria by the contractor and the Government. These differing interpretive opinions can result in the Government determining that a contractor's management control system does not meet the intent of the criteria, thus causing disparity between the Government and the contractor.

Many negative effects can result from the differing criterion interpretations between the Government and the contractor. The working relationship between the two parties can worsen, the work focus of the parties may shift from the projects to each other, and often enough, a schedule delay or cost overrun may be incurred. Other tangible effects can be directly seen by observing the added amount of man-hours the contractors use in preparing for government audits, and then trying to fix items in their cost/schedule (C/S) management systems to meet the requests of the review team. This means that the contractor is spending the government's program dollars on reactive administrative and management issues, when the money should be spent more directly on the products of the particular program.

Specific Objective

Our original intent was to identify the major interpretive differences of the C/S criteria between the government and its contractors, and understand why the differences occur. However the focus of our study changed due to the type of data that we received from our research participants.

Our final objective was to assess the validity of the *Interpretive Guide to the Evaluation/Demonstration Review Checklist for C/SCSC (Appendix E, Joint Implementation Guide)* and determine if its content is in accordance with current practice in the performance management discipline. The *Interpretive Guide* is a tool used to facilitate understanding the intent and meaning of the criteria.

Investigative Questions

We will attempt to answer the following questions in order to achieve our research goal:

1. In which areas of the criteria do the contractor and government normally disagree, and what are the major factors contributing to these different interpretations?
2. How do the Government and Industry personnel perceive the Interpretive Guide and in what areas can it be improved?

Scope

The primary purpose of this research was to create an awareness of the key interpretive differences between the Government and Industry. Additionally, because the *Interpretive Guide* was included in the packages forwarded to the research participants, this provided an excellent opportunity for those individuals in the field to perform a critical evaluation of the *Interpretive Guide* itself. Potential research participants included review directors and team chiefs from each of the Services, the Defense Contract Management Command (DCMC), the Defense Contract Audit Agency (DCAA), and Industry focal points from the National Security Industrial Association (NSIA). Results of this research effort can be used to update the *Interpretive Guide* and generate more discussion of the intent of the criteria between the Government and Industry.

Assumptions

Throughout the course of this project, we performed our research under a set of certain assumptions. These assumptions are listed below.

- There are key interpretive differences between the Government and Industry.

- The *Interpretive Guide* provides key information regarding the "intent" of the criteria.
- The key players in the area of performance management in the Government and Industry have been identified.
- Both Government and Industry personnel are aware that differences do exist and are willing to participate in this research effort in order to effect change.
- The Government and Industry will be willing to meet in a forum to discuss the results of this study.
- The rewrite of the JIG will still be ongoing during the course of this research effort.
- There will be sufficient material remaining to justify a follow-on thesis research.

Limitations

Our primary limitation for this research stemmed from the amount of feedback we received from our research participants. We made every attempt to contact the participants to make them aware of the importance of this research in order to generate a high response rate. We were also aware that there was an ongoing revision of the *Joint Implementation Guide* (JIG) which may have inhibited the number of responses we received. Individuals may have felt uncomfortable voicing their opinions of the criteria until the updated JIG is released and they had time to review the revised document. We were also aware that numerous ongoing reviews being performed by government personnel at the contractor facilities might limit the amount of time the participants would have to respond to the inquiries included in the research package, and thus lower our desired response rate. Finally, although we had promised anonymity when publishing the results of our study, some individuals may not have wanted to release their views on a topic as sensitive as the criteria interpretation, especially when so much of the interpretation is somewhat subjective.

II. LITERATURE REVIEW

In this chapter, we discuss some of the basics of C/SCSC and also introduce a history of the *Interpretive Guide*.

The DoD has always been challenged to obtain consistent, reliable data on the status of major weapon system contracts. To meet this challenge, the DoD has tried a number of different approaches ranging from complete reliance on a contractor's existing internal systems to the imposition of detailed management systems for contractors to use during the performance of defense contracts. The "criteria" approach differs from other management techniques since it allows contractors to use specific management procedures of their choice, but sets forth the characteristics and capabilities which DoD feels should be contained in an effective cost and schedule control system. The DoD requires the criteria to be met by reviewing the contractor's control systems, but to understand the problems that occur because of these reviews, a further understanding of C/SCSC is needed.

What exactly is C/SCSC? First, recognize that it is not a product — not the end result of our management efforts. The product is a successfully fielded weapon system or whatever the system program office (SPO) is tasked to develop and deploy. To achieve the goal of delivering a successful product, both Government and Industry are constantly being challenged to balance the triple constraints of technical performance, resources (cost), and schedule (time). The criteria can be thought of as a unifying concept that identifies the interrelationships, and ensures interaction among all the processes within a contractor's management infrastructure.

Throughout the acquisition cycle of a system, SPOs are continually defining program requirements, planning and executing successful program strategies, and

obtaining, interpreting, and analyzing contract performance data. SPOs need reliable techniques to determine if the program is on schedule and to estimate program costs at completion. C/SCSC provides a framework for achieving and maintaining the necessary programmatic balance.

Where did the C/SCSC come from? It was formally established in 1967 by the Department of Defense (DoD) to standardize contractor requirements for the reporting of cost and schedule performance on major contracts, and to provide visibility of accomplishments on each contract (7:25). The basis for establishing C/SCSC came from the Air Force in 1966, when they initiated a new type of performance measurement system known as Cost/Schedule Planning and Control Specifications (8:9). Today, other U.S. Government departments and agencies are also using similar criteria to the DoD's C/SCSC (7:xi-xii).

Before implementation of C/SCSC, defense contractors were frequently expected to respond to a variety of diverse management requirements from different procuring activities. This requirement made internal and external tracking of performance very complex. Thus, the C/SCSC was established by DoD to eliminate the use of multiple sets of requirements. The requirements were written in criteria form intended for broad interpretation to allow for the broad range of contractors, programs, and phases (7:xi).

The primary objectives of the C/SCSC are twofold: 1) to require contractors to employ management control systems for cost/schedule planning and tracking, and 2) to provide timely and auditable data for use by both contractor and customer project/contract management (7:xi). Again, the criteria are not a product, nor a system, nor technique. They are a set of 35 management system requirements with which some companies working for a DoD acquisition program, over a certain dollar

threshold, must comply. The criteria are grouped into five major categories which are listed in Figure 2-1, including a brief description of each.

The Five Major C/SCS Criteria Categories	
①	Organization Define contractual effort and assign responsibilities for the work.
②	Planning and Budgeting Plan, schedule, budget, and authorize the work.
③	Accounting Accumulate costs of work and material.
④	Analysis Compare planned and actual costs, and analyze variances.
⑤	Revisions and Access to Data Incorporate changes and maintain the baseline. (6:2-3-2-4)

Figure 2-1. Five Major C/SCS Criteria Categories

DoD Instruction 5000.2 (DoDI 5000.2), the keystone of the DoD acquisition rules, states that:

cost/schedule control systems criteria shall be required on significant contracts and subcontracts within all acquisition programs, including highly sensitive classified programs and major construction programs . . . significant contracts are research, development, test, and evaluation contracts with a value of \$60 million or more or procurement contracts with a value of \$250 million or more (in fiscal year 1990 constant dollars). (5:Pt 11 Sect B-2)

DoDI 5000.2 also requires that an acquisition program's contract "shall require that any system used by the contractor in planning and controlling the performance of the contract shall meet the criteria set forth in this section" of the instruction, concerning C/SCSC (5:Pt 11 Sect B-2). This particular instruction insures that the contractor and the Government are both adhering to the same ground rules in terms of C/SCSC definitions and the related reports. DoDI 5000.2 also requires that a contractor's C/S management system be reviewed during various phases of the contracting cycle to ensure that it is compliant with the C/SCS criteria. This is

where problems sometime arise because of the different interpretation of the criteria by the Government and contractor personnel.

When requests for proposals specify the requirement of C/SCSC, an evaluation review of the contractor's C/S management system may be conducted during the source selection process. After contract award, an in-plant demonstration review is required to verify that the contractor's system is meeting the criteria. If a contractor already has a C/S compliant system on-line, from a previous contract, it will usually undergo a subsequent application review (SAR) to determine if the contractor has successfully applied the previously approved C/S system to the new contract. The government review team is headed by a review director who establishes the policy parameters for the selected review and by a team chief who directs the team's activities throughout the review. Team members are assembled from various program office functional disciplines and in-plant contract administration and audit offices involved in the particular program.

Late in 1979, the National Security Industrial Association (NSIA)¹ circulated a questionnaire within its membership to solicit information pertaining to Cost/Schedule Systems. One of the many findings was that a number of discrepancies of the contractors' systems were being found in the Demonstration Reviews and SARs after passing previous reviews (4:VIII-6-VIII-9). A later survey by the NSIA Management Systems Subcommittee revealed the same types of information as the previous one (1). Both surveys uncovered the fact that whether or not the same people were on the government review teams, the team's interpretation of some of the criteria changed, from one review team to another, and

¹ The NSIA is a national organization of American industry composed of more than three hundred manufacturing, research and service companies of all sizes which is used as a communication instrument between government and industry for mutual problems, policies, plans and procedures.

found different discrepancies within the contractor's C/S management systems, even though the systems were the same across the different reviews. In general, the studies showed that there were differences between the criteria interpretations of the various review teams and contractor companies. These differences led to many man-hours, and thus much money spent, of trying to resolve discrepancies, which may have been wasted time and money if the interpretation of the criteria was initially the same between both parties.

One of the criticisms of the government review teams is that they are not adequately trained to perform an accurate assessment of the contractor's C/S system (8:17). The criteria are written in very broad terms so that even with proper training, some people argue that the criteria cannot be consistently interpreted (13:20). In order to provide sound, professional training in this area, the Air Force Institute of Technology's (AFIT) courses, SYS 362, Cost/Schedule Control Systems Criteria, and SYS 361, Surveillance of Cost/Schedule Control Systems, focus on the performance measurement discipline and discuss the criteria in detail.

These courses are each two weeks in length and contain both military and civilian students from the different departments of the DoD. Occasionally Industry members, as well as foreign students, attend these offerings.

The courses' "textbooks" contains the *Interpretative Guide to the Evaluation / Demonstration Review Checklist for C/SCSC (Appendix E, Joint Implementation Guide)* (9). The *Interpretive Guide* is a stand-alone document written in the late '70s to facilitate the learning and further understanding of what the criteria mean. Although the document has been updated, the original transcribed interpretation of the criteria has not been thoroughly analyzed as compared to evolution of the interpretation of the criteria throughout the years. Since many review team members use the information contained in the Interpretive

Guide, this may be adding to the problems of interpretative differences between the government and the contractors whose interpretation has evolved through the years.

What is the role of the Performance Measurement Joint Executive Group (PMJEG) in C/SCSC? The PMJEG's mission is to provide uniform policy and guidance on contract performance measurement implementation and oversight. Within the DoD this translates into providing uniform joint policy and procedure recommendations for the component heads of each of the Services and separate operating agencies. Additionally, the PMJEG is responsible for providing uniform contract performance measurement policy guidance interpretation, arbitration, and coordination. Within Industry, the PMJEG arbitrates specific issues concerning performance measurement policy interpretation (11).

In order to support its mission, the PMJEG has established the following goals:

- Make "earned value" a routine part of project management.
- Improve contract performance measurement policy and processes that allow application flexibility in light of evolving management practices.
- Encourage contractors to continuously improve the effectiveness and efficiency of their management control systems.
- Promote acquisition workforce education and training.
- Improve the consistency, timeliness, effectiveness, and efficiency of cost and schedule system reviews within and among DoD components. (11)

The Arthur D. Little Study

Many critics questioned the utility of C/SCSC. They believed the requirement for contractors to meet the requirements of the criteria substantially added to the cost of major defense contracts. In 1982, the DoD awarded a contract to the management consulting firm of Arthur D. Little Company (ADL) to perform an inquiry into the utility of C/SCSC and determine whether it was worth the additional cost to major procurements (7:275).

The primary purpose of the ADL Study was to:

- Determine the degree of acceptance and use of the C/SCSC by defense contractors and government program managers.
- Identify problems and issues, the resolution of which could lead to improvements in the C/SCSC and contract performance measurement reporting requirements.
- Recommend policy changes that will lead to these improvements and could be implemented by the Assistant Secretary of Defense (Comptroller). (7:275)

The ADL study proved to be one of the most comprehensive reviews of the C/SCSC concept performed since its inception. The findings were published in two reports. Four major points stand out:

- The C/SCSC concept is perceived to be useful and outweigh the costs involved.
- There is room for improvement in C/SCSC.
- People using C/SCSC need to better understand its purpose, capability, and limitations.
- The qualifications of C/SCSC practitioners need to be improved. (7:282)

These four points underscore the value added of the *Interpretive Guide*. The intent of the *Interpretive Guide* is to make the criteria more understandable to Government personnel reviewing the contractor's management control system. It is equally important that the contractors have a thorough understanding of the criteria as well. Currently, to the best of our knowledge, there is no similar document used across Industry to translate the intent of the criteria to all of the individuals in the performance management discipline.

Joint DoD/Industry Total Quality Management (TQM) Team

Partially in response to the ADL study, in 1989 the DoD and NSIA formed a TQM team to perform a comprehensive review of the cost/schedule (C/S) management process for both DoD and Industry. Their goal was to identify opportunities to improve the cost and schedule management process. The DoD/NSIA

team established a charter consisting of a definition statement and mission statement.

Cost/Schedule Management Definition Statement: C/S management is a process used to plan, organize, direct, and control tasks and projects by determination of cost and schedule performance, variances from plan, and estimates at completion using earned value measurement techniques. (3:2-3)

TQM Team Mission Statement: The C/S management Process Action Team will employ TQM principles to:

- Identify the DoD and Industry customer needs for effective C/S management.
- Determine the extent to which existing requirements, criteria, policies, and procedures meet these customers' needs.
- Continuously improve acceptance use and effectiveness of C/S management. (3:2-3)

The conclusions reached by the joint team clearly indicated that both, DoD and Industry place high importance on the need for C/S management control systems. They also agreed that change was necessary to improve the quality and efficiency of C/S performance measurement and reporting. Noting the importance of C/S management, the TQM team proposed the following recommendations based upon their review:

- The PMJEG and Defense Systems Management College (DSMC) should establish an executive level course on C/S management for both DoD and Industry executives.
- Contractor's C/S management systems should be improved to provide quality data in an efficient manner. The DoD should encourage enhancements to contractor's systems and system descriptions and expedite approvals.
- Associations such as NSIA should be encouraged to continue their participation with DoD to improve C/S management methods, practices, and reporting.
- C/SCSC training for all users of C/S control systems and data at all DoD schools and contractor locations should be reviewed and improved.
- The program manager and program executive officer should exercise increased responsibility for contract C/S performance measurement, reporting, and analysis to make it useful and meaningful to both DoD and industry. (3:1-3-1-4)

The fact that this review was undertaken underlies how crucial it is for DoD and Industry to have a thorough understanding of the intent of the criteria. Those areas where differences do exist should be identified and discussions between DoD and Industry should be held to begin resolution of these issues.

Inspector General Audit Report on Use of Contractor C/SCSC Data

The objective of this Audit Report (No. 93-067) dated 11 March 1993 was to evaluate the implementation and oversight of cost/schedule control systems and the use of data reported by contractors complying with C/SCSC. The results of the study revealed that although the DoD had made significant efforts to improve the implementation and use of cost/schedule control systems, improvements were still needed. The audit report cited these areas specifically:

- Subsequent Application Reviews were not timely or consistently accomplished. Surveillance of the contractor and subcontractor cost/schedule control systems was not adequately data accuracy was not verified, nor were resources effectively utilized.
- The sufficiency of the performance measurement baselines was not adequately determined either before contract award or during the cost/schedule system review process after contract award.
- The cost/schedule control system data was not consistently considered in progress payment reviews.
- The interrelationship between a contractor's cost/schedule control system and other systems was not adequately considered during contractor surveillance activities.
- Incentives to implement and maintain an effective cost/schedule control system and criteria for withdrawal of a contractor's validated system did not exist.
- Adequate consideration of cost/schedule system implementation was not given before the award of contracts. (10-i-ii)

The audit report also suggested several recommendations, the implementation of which was expected to improve the internal management controls related to

application of cost/schedule control systems and the use of system data. The Under Secretary of Defense for Acquisition recommendations included:

- Consolidate the responsibility for validating contractor cost/schedule systems within the Defense Contract Management Command.
- Revise DoDI 5000.2 and DoD Manual 5000.2-M to require separation of costs for different types of work and baseline sufficiency be reviewed as part of system implementation reviews.
- Establish incentives for implementing and maintaining cost/schedule systems inclusive of criteria for withdrawal of system approvals, and contract clauses for payment withhold for failure to maintain a validated system.
- Implement actions to assess cost/schedule systems and preliminary baseline information during the contract award process.
- Direct distribution of the Defense Acquisition Executive Summary Reports on major defense acquisition programs to the Defense Contract Management Command.

The Director, Defense Contract Audit Agency (DCAA) recommendations included:

- Provide additional training in cost/schedule responsibilities and issue guidance and audit programs for system reviews.
- Establish a cost/schedule system focal point within selected field offices.

Recommendations from the Commander, Defense Contract Management Command (DCMC) included:

- Require a comparison of progress payment estimates-at-completion with an estimate calculated using the cumulative cost performance index.
- Establish effective coordination with program offices and DCAA to ensure that all requirements for surveillance of a contractor's cost/schedule system are accomplished.
- Set up a data base to track corrective actions for system deficiencies.
- Supplement existing policy and procedures for subcontractor oversight.
- Require specific plans for subsequent application reviews that reflect the contract being reviewed and the contractor's past performance in maintaining a valid system on other contracts. (10:ii-iii)

III. METHODOLOGY

This chapter discusses the methodology for collecting and analyzing data and summarizing and presenting the results.

In order for us to try and determine some of the interpretive differences of the criteria, we needed to first establish a plan which would allow us to collect the information we needed from the professionals in the performance management discipline. The steps we used to do this did not deviate much from our original methodology which is outlined in Figure 3-1 on the following page. The rest of this chapter discusses in more detail the steps we used in our research.

Identify Problem Area and Initial Approach

Our original intention was to identify differences in the interpretation of the criteria between the DoD and its industrial partners. Both the Government and its contractors have dedicated personnel working in the performance management discipline. We wanted to collect these individuals' own ideas of what each of the criteria meant to him or her. We needed to establish a mechanism to solicit the responses from the individuals. Thus we considered several options spanning from a detailed questionnaire to investigative interviews with the individuals. We chose a different approach to collect our "data" which gave our respondents more flexibility to describe their viewpoints of the criteria.

We used the *Interpretive Guide* as a baseline tool for the respondents to comment on the criteria and the JIG's checklist questions. The *Interpretive Guide* is organized in the same manner as the JIG's Appendix E (Evaluation/Demonstration Review Checklist for C/SCSC). The checklist questions are divided into the five primary categories of the criteria: Organization, Planning and Budgeting,

Identify problem area and initial approach

- Our initial effort focused on differences in the interpretation of the C/S criteria between the Government and Industry
- *Interpretive Guide* was to be used as reference tool in the research for collecting information

Identify C/S focal points from military services, other DoD agencies, and industry and assign sections of the *Interpretive Guide* to review**Prepare packages for mail-out to research participants**

- Prepare diskettes to collect participant comments
- Develop instructions for incorporating comments on diskettes
- Mail packages to research participants

Perform follow-up with research participants**Collect and sort responses from participants****Perform analysis of data collected**

- Identify major areas where differences exist between Government and Industry
- Review and incorporate suggested areas for improvements in the *Interpretive Guide*

Summarize overall findings

Figure 3-1. Methodology Flow Chart

Accounting, Analysis, and Revisions. A sample page from the Analysis section of the JIG is provided in Appendix D. The *Interpretive Guide* goes one step beyond the JIG's format in that it also provides the reader an interpretation of what each of the criteria and checklist items mean. The interpretations provided in the *Interpretive Guide* are provided as an instructional aid to assist in the learning and understanding of the criteria for the students taking the AFIT SYS 362 courses, Cost/Schedule Control Systems Criteria, and SYS 361, Surveillance of Cost/Schedule Control Systems.

Because the *Interpretive Guide* contains the criteria and checklist items, as well as an established interpretation, we used this document as our primary instrument

for soliciting data. This document provided a baseline for interpretation of the criteria and checklist items so if the respondents needed assistance for a particular item, it was available in the form of the *Interpretive Guide*. We acquired the latest revision of the *Interpretive Guide*, January 1994, to use for our research. We provided a copy of the *Interpretive Guide* to each of the research participants.

Identify C/S Focal Points and Assign Sections of Interpretive Guide for Review

We next had to identify the members of the population who we could involve in our research. The performance management discipline can be considered to have three components, as seen in Figure 3-2: analysis, policy, and surveillance. Analysis entails comparing actual performance with planned performance and explaining any variances from the plan. Policy deals with the system of rules and regulations which outline the guidelines for performance management. Surveillance means the monitoring of the management control system to ensure continued compliance with the intent of the criteria. These components are integral to the success of the programs which they support. We wanted to include representatives from as many

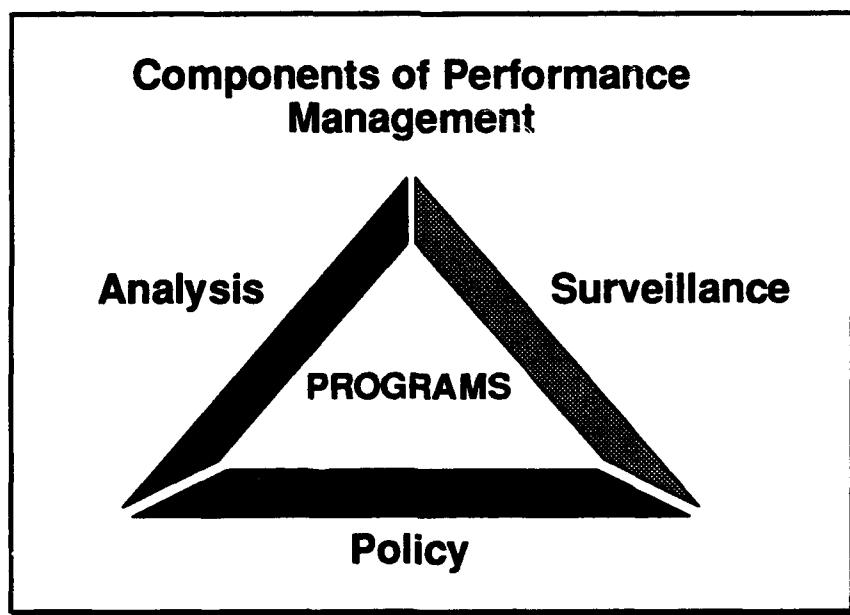


Figure 3-2. Components of Performance Management

different DoD organizations as possible who were involved in at least one of the components of the performance management discipline. We also wanted to try and capture a representative sample of data from several of the companies who were required to use C/SCSC on their DoD contracts.

In order to ensure that we would include a representative DoD sample, we first identified the different organizations involved in working with the criteria. We categorized the organizations as either a policy, surveillance or program type of an organization although the organizations' duties and responsibilities may extend across more than one of the areas. This categorization assisted us in identifying different DoD organizations involved in performance management and the criteria, although we do not claim to have identified all of the organizations which contribute to this discipline. The organizations we identified can be seen in Figure 3-3. Since all of these organizations deal with the contractor companies – either indirectly or

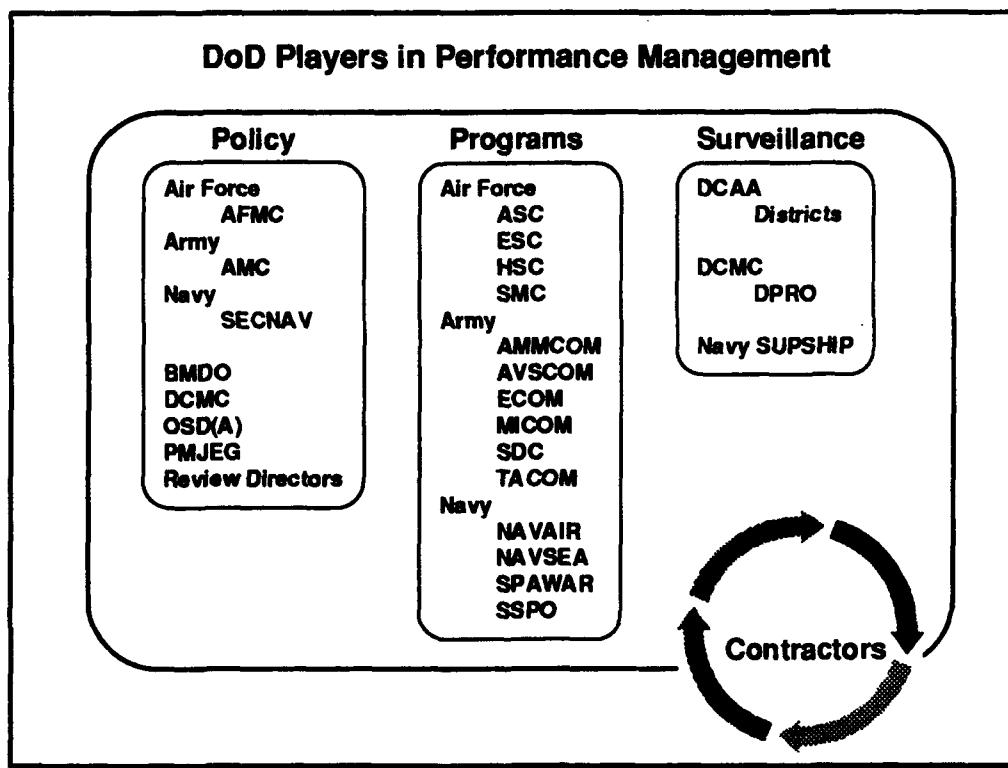


Figure 3-3. DoD Players in Performance Management

directly – we included the contractors as an inclusive component of the figure as well. Note that the organizations are aligned similarly to the components of performance management mentioned previously; analysis is performed in each of these organizations but at different levels.

After we identified the DoD organizations we thought should be involved in this study, we contacted at least one individual from each of the different components. This initial contact helped us to identify the "correct" office and people within the department to assist us in responding to our research.

The Industry portion of our respondents came primarily from members of the NSIA. During the beginning of our project we established a key contact point within the NSIA's Management Systems Subcommittee. This contact inspired a high level of interest within the NSIA concerning our project. This NSIA subcommittee volunteered six people to provide data for our research. Additional Industry personnel were identified by AFIT.

After establishing the points of contact (POC) within DoD and Industry, we built a database of the offices and POCs. The database was used to keep track of addresses, phone numbers, and the sections of the *Interpretive Guide* which the personnel were asked to review.

We assigned different sections of the *Interpretive Guide* to the people and offices based upon their primary type of work they perform in the performance management discipline. We tried to select sections of the *Interpretive Guide* which most closely paralleled the line of work of the respondents. For instance, because DCAA primarily plays an "auditors" role in the realm of C/SCSC, we asked the DCAA representatives to review the "Accounting and Indirects" section of the *Interpretive Guide*. Table 3-1 displays the sections to be reviewed and the number of research packages, discussed later, sent to each organization.

Table 3-1. Number of Research Packages Mailed.
(Air Force organizations are shaded)

ORGANIZATION	SECTION(S) TO BE REVIEWED	# PACKAGES
AFMC	Any Section	1
ASC	Organization/Planning and Budgeting	11
ESC	Revisions	3
HSC	Organization	3
SMC	Revisions	8
Amy	Planning and Budgeting	10
BMDO (CTI)	Planning and Budgeting	1
DCAA	Accounting and Indirects	15
DCMC	Revisions/Analysis	15
Navy	Analysis	9
NSIA	All Sections	6
Other Contractors	Any Section	5
TOTAL		87

Prepare Packages for Mail-out to Research Participants

In order to effectively collect the responses from the participants, we designed a data collection process involving the distribution of floppy diskettes. We felt this approach would allow for a systematic means to collect the data from the respondents and also permit us to use the data easier and reduce the amount of "data entry" from the responses and expedite our write-up process. We sent out a floppy diskette with the criteria and checklist questions included on it, with spaces provided on the diskette files for the individuals to provide their responses. We asked that the diskette be returned to us once their responses were saved to it. Each "research package" was composed of the diskette, an introductory letter of the research, directions for replying to the research, and a paper copy of the *Interpretive Guide*. These items are described in more detail below.

We first extracted the criteria and the checklist questions from the *Interpretive Guide*, excluding the interpretive text from the document. We used a word processor to perform this function from an "electronic" copy of the document. We also added

"placeholders" in the electronic file to allow for the participants to type their responses. We then saved the modified document into five separate files, each corresponding to the related section of the *Interpretive Guide*.

We created a sixth independent file which contained additional questions not found in the *Interpretive Guide*. These three additional questions were created to solicit responses outside of those from the comments of the criteria and checklist questions. The three questions we included were:

- ① What effect does the C/SCSC have on the system acquisition concept?
- ② What changes, if any, do you feel should be made to the criteria or the C/SCSC discipline as employed within the DoD?
- ③ Do any of the criteria (or checklist questions) need to be modified or deleted? Please explain.

These questions also had a placeholder for the participants to provide their responses. We then also added an additional area for the participants to provide any additional comments on any criterion or performance measurement issue that they wanted to add.

We then formatted and saved the six files in five popular word-processing formats to enable maximum flexibility and ease of use by our participants. The different formats included: Word for Windows 2.0, WordPerfect 5.1, Word for Macintosh 5.0, Rich Text Format (RTF), and the most basic text-style format (TXT).

We formatted a 3½ inch high density, double-sided diskette in the standard personal computer (PC) format for MS-DOS. We labeled the disk and copied the files to it, keeping the files of the different word-processing formats in separate directories. We then made enough copies of the original diskette to send to each of our planned participants.

We constructed a cover letter to accompany each research package. The cover letter briefly described the research and the process being used to collect the

information. This letter asked for the cooperative participation from each of its recipients and a copy of it is contained in Appendix E.

In addition to the cover letter, we sent a detailed two-page information sheet along with each package. This information sheet asked the respondent for his/her confirmation of the address, phone number, and position title. The sheet provided the respondent with the section(s) we wanted him/her to provide comments on as well as the detailed instructions of how to use the diskette to provide the responses.

A copy of these instructions is included in Appendix F.

The final component of each research package was a paper copy of the *Interpretive Guide*. All of these elements together comprised one research package for one participant. We asked for the responses to be returned to us on the diskette and set a deadline for the responses approximately 45 days from their day of receipt of the package although we were flexible and allowed for late responses.

Some of the research packages were mailed in bulk to one POC in an organization, leaving the distribution of the packages within the organization left up to the POC. We found that this method of distribution led to the worst response rates within an organization. This was perhaps due to the packages not leaving the desk of the POC, and becoming "lost mail". The possible reasons why this happened are numerous and we can only speculate why it actually occurred.

Perform Follow-up with Research Participants

After mailing the packages we performed an initial follow-up by phone to make sure that the packages arrived safely to the recipients. We then called the participants 15 to 25 days later to see if there were any problems and to remind them of the closing deadline for the responses. We were able to reach nearly 80

percent of the people we were trying to talk to, leaving phone messages with the others.

Those individuals we did talk to generally expressed a sincere interest in our research. Some said that they would be able to return their responses by our deadline, others asked for an extension to finish. Others regretfully informed us that they would probably not be able to provide us with their responses, although they said they wanted to, because they were so busy with the work they had to do for the office. Many commented that their offices had recently experienced a reduction in force and had also been tasked with more work to perform. This follows the recent "do more with less" phenomenon experienced in both the Government and Industry. Although the Industry participants confirmed that this was occurring in their workplace as well, they tended to be more excited about participating in our research and made more of an effort to provide us with their comments.

Collect and Sort Responses from Participants

Upon receiving the responses, we examined the diskette to determine which sections of the criteria the respondents commented on. We then opened the files the respondents modified and examined them to make sure that we were able to read the responses and that the file was not corrupted in any way. There were two cases in which we had to ask the participants to send a "backup copy" of their responses on another disk because of a problem with the files we had received. Overall, our process for collecting the respondents comments worked out very smoothly and provided for an easy transition into our final format of the written thesis.

Once we received and identified the responses, we started to put them together in a systematic manner. We first assigned a code to each respondent, based upon whether he/she was a Government employee or an Industry member. We then

fastened all of the related responses together in our word processor, using the respondent code as an identifier between each of the different responses. We created one word-processing file containing all of the responses. The file was segmented into the five criteria sections and included a sixth section for the "additional questions" we asked the participants to respond to.

The number of responses we received was much lower than we expected – most notably in the Government sector. Table 3-2 displays the number of responses we received as well as the number of research packages we sent to the organizations. Of all the Government components, we received comments only from the Air Force (4 of 26 for a 15.4% response rate) and Navy (2 of 9 for a 22.2% response rate). This resulted in a return rate of 7.9% of the research packages that we mailed to the Government.

We received greater cooperation from our selected Industry participants with a 63.6% response rate (7 of 11). All of the six NSIA members we contacted returned

Table 3-2. Number of Research Package Responses Received.
(Air Force organizations are shaded)

ORGANIZATION	# PACKAGES MAILED	# RESPONSES RECEIVED
AFMC	1	0
ASC	11	3
ESC	3	0
HSC	3	1
SMC	8	0
Army	10	0
BMDO (CTI)	1	0
DCAA	15	0
DCMC	15	0
Navy	9	2
NSIA	6	6
Other Contractors	5	1
TOTAL	87	13

comments on at least one of the five sections of the criteria. One additional Industry member, outside of the NSIA participants, also submitted comments.

The responses of the participants can be viewed in Appendix A. Appendix A contains the text of the *Interpretive Guide* along with the participants' responses. The criteria and checklist questions are listed along with the interpretation from the *Interpretive Guide* as well as the comments from the research participants.

Perform Analysis of Data Collected

After completing assembly of the *Interpretive Guide* with the participants' responses, we then examined the content of the responses. We looked at each of the different sections of the criteria separately and tried to find any striking similarities or differences between the responses, especially the differences between Government and Industry responses.

We then focused our analysis on each individual criterion and its related JIG checklist questions. Our next step was to record and summarize the more relevant comments. For this study relevant is defined as a comment which could possibly lead to a significant revision in the *Interpretive Guide*. We "rolled-up" these comments to the criterion level and presented them in Chapter 4, Analysis. We performed the same steps in analyzing the comments on our "additional questions" that was sent to the participants.

Summarize Findings

Once the analysis was completed, we constructed a higher-level summary of each of the criteria sections. The summaries include repeated ideas and themes submitted by the respondents, and how these ideas are being influenced by current acquisition and C/SCSC-related practices and activities. These findings are presented in Chapter 5, Conclusions and Recommendations. After the findings are

presented in Chapter 5, we present our recommendations for future research as well as ideas that will lead to improvements in the *Interpretive Guide*.

IV. ANALYSIS

This chapter provides a brief summary of the responses received during the research for the interpretation of each criterion.

As stated in the methodology section, our intent in the analysis was not to repeat each response received verbatim. Our purpose was to compare the interpretations presented by the Government and Industry. However, the responses received were more focused on discussions of the interpretation/intent of the *Interpretive Guide*, and therefore did not lend themselves to a comparison of individual respondents' interpretation of the criteria. The number of responses per each section of the criteria did not lend to a thorough evaluation of comparison between the Government and Industry respondents. Table IV below displays the number of responses we received for each section of the criteria.

Table 4-1. Number of Responses by Criteria Section

Section	Government Responses	Industry Responses
Organization	4	4
Planning and Budgeting	3	2
Accounting	0	1
Analysis	2	3
Revisions	0	2
Additional Questions	4	5

Because the responses critiqued the *Interpretive Guide's* explanations, we highlighted some of the key components and suggestions of the Government and Industry participants. The entire text of the *Interpretive Guide*, along with all of the respondents' comments, are included in Appendix A.

Organization

Many of the comments received for the Organization criteria were suggestions on how to improve the *Interpretive Guide*. In many instances the comments were related to current management techniques and the growing use of work teams and IPTs.

1. DEFINE ALL THE AUTHORIZED WORK AND RELATED RESOURCES TO MEET REQUIREMENTS OF THE CONTRACT, USING THE FRAMEWORK OF THE CWBS.

The respondents all tended to agree that the contract work breakdown structure (CWBS) is one of the most essential elements for establishing a strong foundation towards accurate performance measurement practices as well as communications between the Government and the contractor. One of the benefits of the product oriented CWBS is that it offers program stability in comparison to the program's dynamic environment of organizational and funding changes. The CWBS should include "all" of the deliverable products including hardware, software, reports, specifications, and minutes of meetings and reviews.

Only one CWBS may be used by the contractor to manage the project and the performance measurement data. Even when changes to the CWBS occur, the contractor should still be using the same CWBS until a formal modification to the contract is made. The CWBS is good to identify work through the cost account level; after that point it loses work identification and becomes organizationally identified. Also, many contracts today require more work team reporting that is not CWBS oriented. The *Interpretive Guide* does not discuss this type of work team reporting and should probably be revised to do so, especially in today's environment of IPTs.

Some of the discrepancies between the *Interpretive Guide*'s intent and the respondents' comments include the CWBS should identify the deliverable products and the elements of the contract that should be subcontracted, but it should not

specify which resources the contractor is required to use to complete the effort. Also, the industry respondents expressed their concern that the *Interpretive Guide* did not adequately describe how the concept of work teams falls into the realm of cost account levels.

2. IDENTIFY THE INTERNAL ORGANIZATIONAL ELEMENTS AND THE MAJOR SUB-CONTRACTORS RESPONSIBLE FOR ACCOMPLISHING THE AUTHORIZED WORK.

Responses for this criterion did not show any differences between Government and industry participants. The Government participants made few comments on this criterion. One stated that the *Interpretive Guide*'s intent should describe how the organizational breakdown structure (OBS) can be enhanced to include IPTs. Another discussed the importance of having a clear definition and accountability of subcontractor work.

The industry responses basically pointed out the importance of the OBS and difficulties that sometimes arise in creating an accurate OBS because of an organization's working groups. Needless to say, an important aspect of this criterion is to verify that a formal process is in place and being used to identify the contractor's chain of authorization and the organizational elements with responsibility. In organizations where matrix support, IPTs, work teams and similar work groups exist, it is very important that the OBS clearly identify the reporting relationships.

There was also mention of the importance of a clear definition of subcontractor work. The OBS must also identify the subcontractor responsible for the work and the internal personnel responsible for the management of that subcontractor. The sharp definition and responsibility of subcontractor work also make it easier to determine and track variances due to subcontractor performance. Reference was

again made that a cost account may be a team with no specific cost account manager, but it still accepts responsibility for the cost account's schedule, cost, and technical requirements.

3. PROVIDE FOR THE INTEGRATION OF THE CONTRACTOR'S PLANNING, SCHEDULING, BUDGETING, WORK AUTHORIZATION, AND COST ACCUMULATION SYSTEMS WITH EACH OTHER, THE CWBS AND THE ORGANIZATION STRUCTURE. (Reference format 1.)

The respondents did not have many differences for this criterion either; most of their comments described a relationship or two and suggested that the *Interpretive Guide* be expanded to include their ideas. For instance, a Government comment suggested the *Interpretive Guide*'s intent include how an audit trail alpha-numeric work designation is used to identify a work package task to cost account, which allows for cost accounts to be summarized by work breakdown structure (WBS), OBS, and even IPTs.

An industry respondent thought the *Interpretive Guide* could be expanded to include a description of technical performance measurement systems to supplement the description of the horizontal and vertical integration of data. The respondent also stated that the information derived from any of these management systems must be consistent and reconcilable with data from all other systems related to the same task.

Another industry respondent discussed the differences in contractors' systems. The variety of systems calls for a common level of data exchange from one system to another, usually done at the work package level or cost account. The cost accounts are identified by the use of a responsibility assignment matrix which is formed by crossing the CWBS with the OBS.

4. IDENTIFY THE MANAGERIAL POSITIONS RESPONSIBLE FOR CONTROLLING OVERHEAD (INDIRECT COSTS).

Again, there were no major differences in the interpretation of this criterion. The Government comments discussed the need for the proper identification of the contractor personnel responsible for the application, monitoring and control of overhead costs. One respondent commented that the *Interpretive Guide*'s discussion could be enhanced by considering what level of the contract is the overhead applied and determining whether or not the labor hours are burdened or unburdened at the cost account level. The respondent also felt that the *Interpretive Guide* could be enhanced by explaining the roles of contractor management personnel in the area of overhead, such as the chief executive officer, controller, plant manager, program manager, functional managers, indirect pool managers, cost account managers, and IPT managers.

One of the industry respondents discussed the importance of overhead cost pools and its association with the OBS and the logic of allocation. The respondent commented that review directors and team chiefs should include Administrative Contracting Office (ACO) and DCAA representatives when reviewing this area of the contractor's systems. Another respondent pointed out that overhead costs are assigned by level of effort. The other industry respondent had a different approach and stated that this criterion should be part of the OBS requirement.

5. PROVIDE FOR INTEGRATION OF THE CWBS WITH THE CONTRACTOR'S FUNCTIONAL ORGANIZATIONAL STRUCTURE IN A MANNER THAT PERMITS COST AND SCHEDULE PERFORMANCE MEASUREMENT FOR CWBS AND ORGANIZATIONAL ELEMENTS. (Provide matrix showing integration.)

Both Government and industry respondents indicated that this criterion needs to be reviewed to allow for today's different management concepts, particularly IPTs. Additionally, checklist item b raised some discussion as to whether or not the

work package level or cost account level should be used as the level for budgeting and measuring performance.

An industry respondent stated that if the first four criteria were met, then the only thing that needed to be done to satisfy this criterion is to develop a matrix to demonstrate the capability. In that respect, the respondent considered this criterion an extension of criterion 3. The respondent concluded the comments for the Organization section of the criteria, stating that, "Structure, capability, and use are a... root of the Organization section of the C/SCSC, which in turn sets the scene for the remainder of the criteria."

Planning and Budgeting

In this section of the criteria there were three participants from the Government and one from industry. Two of the Government respondents primarily agreed with the *Interpretive Guide's* text and provided very little commentary. Thus, almost all of the Government comments discussed in this section are from one respondent.

1. SCHEDULE THE AUTHORIZED WORK IN A MANNER WHICH DESCRIBES THE SEQUENCE OF WORK AND IDENTIFIES THE SIGNIFICANT TASK INTER-DEPENDENCIES REQUIRED TO MEET THE DEVELOPMENT, PRODUCTION, AND DELIVERY REQUIREMENTS OF THE CONTRACT.

The Government respondent would like to see the *Interpretive Guide* discuss who and how scheduling systems are established, statused, and forecasted. Also desired is a horizontal and vertical tracing of the schedule through the use of successor and predecessor identification.

The industry respondent provided comments on the checklist questions, referring to master program schedules and the integration of team schedules. This respondent also believed that in a couple of instances the *Interpretive Guide's* text

inferred a "separate formal scheduling system description where none is required by the criteria."

2. IDENTIFY PHYSICAL PRODUCTS, MILESTONES, TECHNICAL PERFORMANCE GOALS, OR OTHER INDICATORS THAT WILL BE USED TO MEASURE OUTPUT.

The majority of the comments for this criterion came from the previously mentioned industry respondent. The respondent suggested that the *Interpretive Guide*'s interpretation for this criterion should also address level of effort. Another comment suggested again that the *Interpretive Guide* inferred a "separate formal scheduling system description where none is required by the criteria" for the first checklist question. The respondent also suggested that the *Interpretive Guide* should acknowledge other methods for assessing work accomplishment besides the use of milestones. A final comment on this criterion suggested that the *Interpretive Guide* should stress the performance measurement baseline (PMB), and its various tiers of the schedule, be maintained with strict baseline control.

3. ESTABLISH AND MAINTAIN A TIME-PHASED BUDGET BASELINE AT THE COST ACCOUNT LEVEL AGAINST WHICH CONTRACT PERFORMANCE CAN BE MEASURED. INITIAL BUDGETS ESTABLISHED FOR THIS PURPOSE WILL BE BASED ON THE NEGOTIATED TARGET COST. ANY OTHER AMOUNT USED FOR PERFORMANCE MEASUREMENT PURPOSES MUST BE FORMALLY RECOGNIZED BY BOTH THE CONTRACTOR AND THE GOVERNMENT. (Reference formats 2 and 8.)

The same two respondents mentioned above contributed comments to this criterion. The Government respondent's first comment concerned the participation of the functional manager, as described in the *Interpretive Guide*. The comment is that a functional manager may not become involved in the assignment of a work package; the functional manager may be replaced with an IPT. This respondent described another practice when IPTs are used - that is the work package becomes the lowest level because actuals are charged at work package level.

Both Government and industry respondents submitted a comment to improve the *Interpretive Guide's* description of checklist item **e**, dealing with the opening and closing of cost accounts. The Government respondent commented that a cost account may still be open for a couple of months after the work has actually been completed to allow for late charges or adjustments to the account. The industry comment was a suggested "better" way to reword a sentence in the *Interpretive Guide* concerning the work performed in intervening months of a cost account.

The industry respondent provided two additional comments concerning the interpretation provided in the *Interpretive Guide*. The first comment suggests that the interpretation for checklist item **b** "should be expanded to include an expansion of the discussion of where the budget is held pending roll-down to the cost account level." The other comment voiced the disagreement with the *Interpretive Guide's* interpretation of checklist question **d**; see the response in Appendix A for further details.

4. ESTABLISH BUDGETS FOR ALL AUTHORIZED WORK WITH SEPARATE IDENTIFICATION OF COST ELEMENTS (LABOR, MATERIAL, ETC.) (Reference formats 2, 3, and 4.)

This criterion received minor comments to enhance the *Interpretive Guide's* interpretation of it and its checklist questions. One of the reoccurring comments in this section pertained to IPTs and the need for the *Interpretive Guide* to reflect the IPT's involvement.

5. TO THE EXTENT THE AUTHORIZED WORK CAN BE IDENTIFIED IN DISCRETE, SHORT-SPAN WORK PACKAGES, ESTABLISH BUDGETS FOR THIS WORK IN TERMS OF DOLLARS, HOURS, OR OTHER MEASURABLE UNITS. WHERE THE ENTIRE COST ACCOUNT CANNOT BE SUBDIVIDED INTO DETAILED WORK PACKAGES, IDENTIFY THE FAR TERM EFFORT IN LARGER PLANNING PACKAGES FOR BUDGET AND SCHEDULING PURPOSES. (Reference format 6.)

This criterion received the majority of its feedback in its checklist questions by the industry respondent. The respondent critiqued the *Interpretive Guide's* text (checklist items **b** and **c**) concerning the "planning requirement that ensures that all work is always planned at least "X" months into the future," stating that there is no criteria requirement for "X" months of advance planning. The other critique of the *Interpretive Guide's* interpretation comes from checklist question **h**; here the respondent states that "there is no criteria requirements for cost accounts to be budgeted in terms of dollars."

6. PROVIDE THAT THE SUM OF ALL WORK PACKAGE BUDGETS PLUS PLANNING PACKAGES WITHIN A COST ACCOUNT EQUALS THE COST ACCOUNT BUDGET. (Reference format 2)

Respondents agreed with the intent/interpretation of the *Interpretive Guide* and provided no additional comments.

7. IDENTIFY RELATIONSHIPS OF BUDGETS OR STANDARDS IN UNDERLYING WORK AUTHORIZATION SYSTEMS TO BUDGETS FOR WORK PACKAGES.

This criterion received very few comments also. A Government respondent commented that when engineering standards are used to establish a budget, there is sometimes an insufficient budget to cover the standard.

8. IDENTIFY AND CONTROL LEVEL OF EFFORT ACTIVITY BY TIME-PHASED BUDGETS ESTABLISHED FOR THIS PURPOSE. ONLY THAT EFFORT WHICH CANNOT BE IDENTIFIED AS MEASURED EFFORT OR AS APPORTIONED EFFORT WILL BE CLASSED AS LOE. (Reference format 6.)

This criterion received only one comment. The Government respondent stated that the *Interpretive Guide's* description for checklist question **a** should also contain level of effort (LOE) information from PMJEG guidance number 5, dated 23 October 1989, "Replan future LOE to correlate to the changes in work."

9. ESTABLISH OVERHEAD BUDGETS FOR THE TOTAL COSTS OF EACH SIGNIFICANT ORGANIZATIONAL COMPONENT WHOSE EXPENSES WILL BECOME INDIRECT COSTS. REFLECT IN THE CONTRACT BUDGETS AT THE APPROPRIATE LEVEL, THE AMOUNTS IN OVERHEAD POOLS THAT WILL BE ALLOCATED TO THE CONTRACT AS INDIRECT COSTS. (Reference DCAA Audit Manual and FAR 31.203) (Reference format 7.)

Respondents agreed with the intent/interpretation of the *Interpretive Guide* and provided no additional comments.

10. IDENTIFY MANAGEMENT RESERVES AND UNDISTRIBUTED BUDGET.

This criterion also received a minimal number of comments. A Government respondent added a comment to checklist question **c** about non-negotiated work. The industry respondent agreed with all of the *Interpretive Guide's* interpretation except part of checklist question **d** -- the "undistributed budget (UB) may be in terms of the estimated value of the statement of work when a negotiated value has not yet been established."

11. PROVIDE THAT THE CONTRACT TARGET COST PLUS THE ESTIMATED COST OF AUTHORIZED BUT UNPRICED WORK IS RECONCILED WITH THE SUM OF ALL INTERNAL CONTRACT BUDGETS AND MANAGEMENT RESERVES. (Reference formats 3, 4, and 5.)

Respondents agreed with the intent/interpretation of the *Interpretive Guide* and provided no additional comments.

Accounting

We had anticipated receiving comments from both the Government and industry; however, we only received responses from industry on this criteria element. What follows are the criteria elements along with a brief explanation of their "intent".

1. RECORD DIRECT COSTS ON AN APPLIED OR OTHER ACCEPTABLE BASIS CONSISTENT WITH THE BUDGETS IN A FORMAL SYSTEM THAT IS CONTROLLED BY THE GENERAL BOOKS OF ACCOUNT.

According to the *Interpretive Guide*, the intent of this criterion is to ensure that the contractor's accounting system has the capability to account for direct costs in a logical and prudent manner. Our respondent agreed with the interpretation provided in the *Interpretive Guide*. However the respondent suggested this criteria element would be more appropriate in the analysis section, thus limiting the Accounting section to questions ensuring costs are accumulated, controlled, and traceable from the contractor's ledger accounts to financial reports prepared for the Government.

2. SUMMARIZE DIRECT COSTS FROM THE COST ACCOUNTS INTO THE WBS WITHOUT ALLOCATION OF A SINGLE COST ACCOUNT TO TWO OR MORE WBS ELEMENTS. (Reference format 3)

The *Interpretive Guide* suggests that direct costs from cost accounts should only be allocated to one higher level WBS elements thus precluding multiple counting of the costs. Also, if cost accounts were rolled up to more than one WBS elements, this would cause one to question whether or not the WBS accurately reflects the way work is being done. The respondent agreed with the write-up and suggested that where identical tasks existed across several WBS elements, a summary level cost account would be beneficial, assuming the costs could appropriately be segregated into their WBS elements.

3. SUMMARIZE DIRECT COSTS FROM THE COST ACCOUNTS INTO THE CONTRACTOR'S FUNCTIONAL ORGANIZATIONAL ELEMENTS WITHOUT ALLOCATION OF A SINGLE COST ACCOUNT TO TWO OR MORE ORGANIZATIONAL ELEMENTS. (Reference format 4)

This element is very similar to the previous criteria element with the exception that it focuses on the OBS. Again, the intent is to ensure that the cost accounts are not "rolled-up" to more than one higher level element. OBS responsibility to the WBS elements should be assigned by the responsibility assignment matrix (RAM). Here, the respondent stated that this element should consider the new IPT structure and the reviewer should be aware that this structure is cross-functional and could have a mix of cost accounts or cost elements incorporated in the data.

4. RECORD ALL INDIRECT COSTS WHICH WILL BE ALLOCATED TO THE CONTRACT.

The purpose of this element is to ensure that the contractor has in place a system which properly accumulates and allocates indirect costs. The respondent, although agreeing with the interpretation provided by the *Interpretive Guide*, stated this section was redundant and could have been discussed in the Planing and Budgeting section which covers controlling indirect costs.

5. IDENTIFY THE BASES FOR ALLOCATING THE COST OF APPORTIONED EFFORT.

The contractor should have a system in place to identify the base(s) to which apportioned effort is related. Additionally, procedures should be in place which explain and quantify the relationship between apportioned effort and its discrete effort base. The respondent suggested placing this element under Planning and Budgeting.

6. IDENTIFY UNIT COSTS, EQUIVALENT UNIT COSTS, OR LOT COSTS AS APPLICABLE.

Being able to ascertain unit costs, or a derivation thereof, facilitates future pricing efforts. The *Interpretive Guide* states that determining unit costs also helps establish current negotiation postures and helps provide justification for "fair and reasonable" acquisition costs of items purchased by the Government. The respondent agreed with the interpretation provided by the *Interpretive Guide* as written.

7. THE CONTRACTOR'S MATERIAL ACCOUNTING SYSTEM WILL PROVIDE FOR ACCURATE COST ACCUMULATION AND ASSIGNMENT OF COSTS TO COST ACCOUNTS IN A MANNER CONSISTENT WITH THE BUDGETS USING RECOGNIZED, ACCEPTABLE COSTING TECHNIQUES; DETERMINATION OF PRICE VARIANCES BY COMPARING PLANNED VERSUS ACTUAL COMMITMENTS, COST PERFORMANCE MEASUREMENT AT THE POINT IN TIME MOST SUITABLE FOR THE CATEGORY OF MATERIAL INVOLVED, BUT NO EARLIER THAN THE TIME OF ACTUAL RECEIPT OF MATERIAL; DETERMINATION OF COST VARIANCES ATTRIBUTABLE OF THE EXCESS USAGE OF MATERIAL, DETERMINATION OF UNIT OR LOT COSTS WHEN APPLICABLE, AND FULL ACCOUNTABILITY FOR ALL MATERIAL PURCHASED FOR THE CONTRACT INCLUDING THE RESIDUAL INVENTORY.

This element establishes the characteristics that all contractor's material accounting systems should follow. These characteristics must be adhered to even though differences may exist between contractors' accounting systems. Again, the respondent agreed with the *Interpretive Guide*'s interpretation with the exception of residual inventory which belonged in the property accounting area of Government oversight.

Analysis

This criteria section prompted several responses from both Government and industry. Rather than merely restating the responses verbatim, we summarized the

comments and noted differences from the interpretation provided by the *Interpretive Guide* as well as any differences between Government and industry responses.

1. IDENTIFY AT THE COST ACCOUNT LEVEL ON A MONTHLY BASIS USING DATA FROM, OR RECONCILABLE WITH, THE ACCOUNTING SYSTEM; BCWS AND BCWP; BCWP AND APPLIED (ACTUAL WHERE APPROPRIATE) DIRECT FOR THE SAME WORK; VARIANCES RESULTING FROM THE ABOVE COMPARISONS CLASSIFIED IN TERMS OF LABOR, MATERIAL, OR OTHER APPROPRIATE ELEMENTS, TOGETHER WITH THE REASONS FOR THE SIGNIFICANT VARIANCES.

This criterion element focuses on several key points. First, it states that the analysis should be accomplished on a regular basis at the cost account level. Additionally, the data being analyzed should either come directly from or be reconcilable with the accounting system the contractor has in place. Finally, this element lists the minimum performance indicators which should be included in the analysis inclusive of BCWP, BCWS, ACWP and any resultant variances which result from comparing these indicators. If any "significant" variances, where significance is determined by comparison to a threshold, those variances should be investigated and explained.

The responses from the Government agreed with the *Interpretive Guide's* explanation. However, there was some question as to the meaning of "significant" and the use of "thresholds." Their primary concern stemmed from the fact that arbitrary threshold amounts created an administrative and documentation burden for the cost account managers (CAMs) who were charged with the responsibility for developing the variance analysis reports (VARs). These VARs were primarily prepared for Government review teams. The Government respondents advocated more direct communication between the program offices and contractor rather than merely relying on monthly written reports to explain variances. They believed more open dialogue when discussing variances would cause the program office and the

contractor to take greater ownership of the performance measurement system and work in a more timely manner to resolve differences.

The respondents from industry suggested that the threshold related to the significance of a variance should be stated in either absolute dollars or a percentage of the current, cumulative, and at completion BCWS. These thresholds are normally established by the contractor working closely in conjunction with the program office. Another respondent stressed the need for updating the *Interpretive Guide* regarding contractor's efforts to streamline current system descriptions to accommodate summary level VARs which precluded the existing requirement for variance analysis to be performed on all open cost accounts. The major reason cited for summary level reporting was the growing dissatisfaction in industry of the excessive administrative detail. Summary level variance analysis incorporates more than one cost account and focuses on identifying those cost accounts with significant variances as determined by mutual agreement between the program office and the contractor.

2. IDENTIFY ON A MONTHLY BASIS, IN THE DETAIL NEEDED BY MANAGEMENT FOR EFFECTIVE CONTROL, BUDGETED INDIRECT COSTS, ACTUAL INDIRECT COSTS, AND VARIANCES, ALONG WITH THE REASONS. (Reference format 7)

The *Interpretive Guide* recognizes the difficulty of capturing and measuring overhead on a contract-by-contract basis. Currently, the criteria requires only a minimum of monthly overhead variance analysis where actual overhead is compared to budgeted overhead with any significant differences being explained.

The industry respondents suggested a rewrite of this criteria element to separately discuss the earned value program management system as the contractor program manager's (CPM) primary responsibility. Those aspects of the contract dealing with overhead, of which the CPM has less control, should be relegated to existing Government regulations which address capturing overhead costs. This view

by industry does conflict somewhat with the *Interpretive Guide*'s explanation which makes it imperative that the contractor exercise maximum control over their overhead procedures.

3. SUMMARIZE THE DATA ELEMENTS AND ASSOCIATED VARIANCES LISTED IN ITEMS 1 AND 2 ABOVE THROUGH THE CONTRACTOR ORGANIZATION AND WBS TO THE REPORTING LEVEL SPECIFIED IN THE CONTRACT. (Reference formats 2, 3, 4, 5)

This element seeks to ensure consistency between data being used by the contractor and data being reported to the Government. The arrangement of the WBS and the OBS provides for responsibility definition and facilitates identification of problem areas among all levels of the contractor's organization and scope of work. Most of the respondents from both the Government and contractor organizations agreed with the interpretation as written, however, they suggested incorporating the IPT concept in the explanation.

Regarding the issue of having formal written procedures for documenting and reporting variance analyses, the *Interpretive Guide* stressed the need for routinely reporting those variances which exceed predetermined thresholds. However, the respondents from industry stressed that formal written analyses of all variances at the cost account level should not be mandated; rather, reporting could be captured with summary level VARs under an approved system description.

4. IDENTIFY ON A MONTHLY BASIS SIGNIFICANT DIFFERENCES BETWEEN PLANNED AND ACTUAL SCHEDULE ACCOMPLISHMENT.

According to the *Interpretive Guide*, the intent of this criterion is to ensure integration of schedule management and analysis, meaning schedules must be managed by: 1) the work they represent and 2) their cost, as shown in a BCWS or BCWP data element. By reporting on a monthly basis, the time factor of the

schedule variance is not lost. Both the Government and industry respondents agreed with the *Interpretive Guide*'s explanation.

5. IDENTIFY MANAGERIAL ACTIONS TAKEN AS A RESULT OF CRITERIA ITEMS 1-4 ABOVE.

Proper managerial action, inclusive of identification, documentation, reporting, and follow-up of significant variances, is the *Interpretive Guide*'s interpretation of this criterion. Contractor managers should always focus on why they are going through the analysis process. The respondents agreed with this interpretation.

6. BASED ON PERFORMANCE TO DATE, ON COMMITMENT VALUES FOR MATERIAL, AND ON ESTIMATES OF FUTURE CONDITIONS, DEVELOP REVISED ESTIMATES OF COSTS AT COMPETITION FOR WBS ELEMENTS IDENTIFIED IN THE CONTRACT AND COMPARE THESE WITH THE CONTRACT BUDGET BASE AND THE LATEST STATEMENT OF FUNDS REQUIREMENTS REPORT TO THE GOVERNMENT. (Reference formats 2, 3, 4, 5, 10, and 11.)

The *Interpretive Guide* states this criterion focuses on ensuring EACs are constructed properly and that they be compared to the amount of work actually authorized and to the Government's LRE. The LRE is essentially an estimate-at-completion (EAC) which has been updated to account for any programmatic changes which have occurred since the calculation of the last completion estimate. The industry respondents believed this criterion would be the appropriate place to recognize the importance of management reserve (MR), which enables the contractor to cover work which is in the scope of the contract although not formally incorporated into a cost account. It may not have been incorporated into a formal cost account. The MR allows the contractor to minimize the need for over target baseline (OTB) requests and thus maintain a smoothly functioning management control system.

Regarding the construction of estimate at completion costs, the majority of the Government respondents agreed with the interpretation of the criteria as written. The industry respondents believed that the *Interpretive Guide* should include in its EAC discussion an explanation of "material commitment" and why it is important that this be known by the CAM preparing the EAC. Knowing the material commitments, according to the respondents, increases the EAC's accuracy by avoiding significant omissions or double counting which may occur.

The remainder of the EAC discussion focused on ensuring the EACs were generated by knowledgeable personnel who have intimate knowledge of the particular cost account for which they are forecasting. Industry respondents recommend the *Interpretive Guide* be amended to ensure the CAM's EAC is properly reviewed by the functional manager and program manager in terms of overall reasonableness and support of programmatic objectives. They also stressed the importance of incorporating subcontractor EACs into the final cost reports prepared for the Government.

Revisions

We only received comments from industry for the revisions section. As with the previous criteria elements, the major points are captured with specific respondent comments incorporated in Appendix A.

1. INCORPORATE CONTRACTUAL CHANGES IN A TIMELY MANNER, RECORDING THE EFFECTS OF SUCH CHANGES IN BUDGETS AND SCHEDULES. IN THE DIRECTED EFFORT BEFORE NEGOTIATION OF A CHANGE, BASE SUCH REVISIONS ON THE AMOUNT ESTIMATED AND BUDGETED TO THE FUNCTIONAL ORGANIZATIONS.

The *Interpretive Guide* explains that this criterion mandates two standards for the contractors management control system (MCS). First, the contractor must incorporate any government scope of work, budget, and schedule changes in a timely

manner; thus ensuring budget and work remain assigned together. Secondly, the contractor should develop his "best estimate" for any unpriced change orders issued by the program office. The major areas of improvement from the respondents suggest recognition of subcontractor effort on change orders since much of the prime's effort is now subcontracted.

2. RECOGNIZE ORIGINAL BUDGETS FOR THOSE ELEMENTS OF THE WBS IDENTIFIED AS PRICE LINE ITEMS IN THE CONTRACT, AND FOR THOSE ELEMENTS AT THE LOWEST LEVEL OF THE DOD PROJECT SUMMARY WBS. WITH CURRENT PERFORMANCE MEASUREMENT BUDGETS IN TERMS OF CHANGES TO THE AUTHORIZED WORK AND INTERNAL REPLANNING IN THE DETAIL NEEDED BY MANAGEMENT FOR EFFECTIVE CONTROL. (Reference formats 8 and 9)

The *Interpretive Guide* states that any budget changes reportable to the Government must be traceable in the contractor's MCS. Normally, according to the *Interpretive Guide*, this is accomplished through budget control logs. Here, the industry respondents highlighted the need for placing more "reality" into the traces, especially with programs extending over a long period of time and those cases where an OTB has been implemented.

3. PROHIBIT RETROACTIVE CHANGES TO RECORDS PERTAINING TO WORK PERFORMED THAT WILL CHANGE PREVIOUSLY REPORTED AMOUNTS FOR DIRECT COSTS, INDIRECT COSTS, OR BUDGETS, EXCEPT FOR CORRECTION OF ERRORS AND ROUTINE ACCOUNTING ADJUSTMENTS.

This criterion is fairly straight forward in that it prohibits any retroactive changes to performance measurement data. Respondent comments indicate that errors do possibly exist in the performance data which needs correcting. They further iterate that corrections to errors are allowable and appropriate when they are supported and explained and program office approval is secured.

4. PREVENT REVISIONS TO THE CONTRACT BUDGET BASE EXCEPT FOR GOVERNMENT DIRECTED CHANGES TO THE CONTRACTUAL EFFORT.

According to the *Interpretive Guide*, only the Government has the authority to change the contract budget base (CBB) which is normally accomplished through the contract change modification. The respondents agreed with the explanations provided by the *Interpretive Guide*.

5. DOCUMENT INTERNALLY, CHANGES TO THE PERFORMANCE MEASUREMENT BASELINE AND, ON A TIMELY BASIS, NOTIFY THE PROCURING ACTIVITY THROUGH PRESCRIBED PROCEDURES.

Since the PMB is the gauge by which contractor progress is measured, any changes to it must be fully documented and reported to the Government, thereby enabling both the Government and contractor to be measuring by the same "yardstick." One of the respondents took issue with the fact that the *Interpretive Guide* stated the contractor should seek approval before "any" replanning actions affecting open work packages. The respondent commented that this took away from the contractor's authority and responsibility to manage the program and placed the Government in the position of managing the day-to-day details necessary to deliver the final product.

6. PROVIDE THE CONTRACTING OFFICER AND DULY AUTHORIZED REPRESENTATIVES ACCESS TO ALL OF THE FOREGOING INFORMATION AND SUPPORTING DOCUMENTS.

The *Interpretive Guide* states that this criterion ensures Government review team access to the contractor's performance measurement data. This does not necessarily mean physical transfer of records; especially if the data are of a proprietary nature. If the contractor denies Government review team access to any pertinent data, then that contractor is in violation of the contract with the Government. Data access is necessary to assess compliance with C/SCSC. The respondents concurred with this explanation.

Additional Questions

In addition to the questions from the criteria, we also asked the research participants to respond to some additional questions. The complete responses are located in Appendix A. Here, we only present a brief summary of the major points.

1. WHAT EFFECT DOES THE C/SCSC HAVE ON THE SYSTEM ACQUISITION CONCEPT?

The Government respondents believed C/SCSC had an overall positive effect on the system acquisition concept. They believed the criteria concept promotes a disciplined, consistent, and focused approach for managing major acquisition projects and facilitates more confident and timely decision making by the Government program manager.

The industry respondents had a somewhat different view of the effect of the criteria concept on system acquisition. Although agreeing in theory the concept is good, actual implementation has made the concept overly burdensome and expensive. They believed some aspects of the criteria have been used as a lever to accomplish subjective rather than objective performance measurement goals. The respondents stressed the need for an emphasis on measuring overall quality in terms of management effectiveness rather than focusing on tracking individual data elements to discover discrepancies based upon subjective threshold determinations. The industry respondents all agreed that the criteria concept itself is not the problem. The problem stems from interpretation by both, Government and industry, and from implementation.

2. WHAT CHANGES, IF ANY, DO YOU FEEL SHOULD BE MADE TO THE CRITERIA OR THE C/SCSC DISCIPLINE AS EMPLOYED WITHIN THE DOD?

One of the major changes highlight by the Government respondents was the need to develop an "in-house" corps of competent system reviewers. There was a concern that too many of the C/S analyst positions were being contracted out,

resulting in a situation where contractors were reviewing other contractors' systems.

Another respondent cited the need to reduce duplicative criteria checklist items. A final recommended change stemmed from the complexity of the numerous management control systems used by different contractors. The respondent believed the field administrative contract offices (ACOs) were the best equipped to evaluate contractor systems since they work with the contractor on a daily basis and have a more intimate knowledge of the strengths and weaknesses of the system.

Education and a more cooperative working relationship were the most notable recommendations cited by the industry respondents. They believed those individuals charged with the responsibility to review contractor MCSs need to have the requisite education and experience to review the myriad of systems currently in the field. The respondents also noted the need to create an atmosphere of openness and mutual cooperation between the Government and contractor organization. This will lead to more effective and efficient initial and follow-on reviews of the MCS.

Additionally, one industry respondent envisioned the creation of management systems which are self-regulating and self-correcting by focusing attention on the output product and earned value statusing. This will lead to the recognition that the quality of the contractor's management system is determined by the presence of management value, not by the absence of defects.

3. DO ANY OF THE CRITERIA OR CHECKLIST QUESTIONS NEED TO BE MODIFIED OR DELETED? SHOULD THERE BE ANY ADDITIONAL ONES ADDED? PLEASE EXPLAIN.

Several of the Government respondents noted the fact that the JIG is currently undergoing a major revision which may alleviate some of the problems with the criteria and its checklist items, especially since some of the checklist items are somewhat redundant. Another respondent cited the need to incorporate more

flexibility in what constituted adequate variance analysis, especially since the current system required monthly reporting even though conditions have remained the same. Finally, it was suggested that the criteria should incorporate procedures for requests to replan or reprogram.

The industry respondents also noted the current JIG rewrite. Several recommended removing the criteria checklist and replacing it with a description of the basic intent of the criteria which would in turn facilitate understanding the benefits of compliance. A final industry recommendation was to recognize that many companies have switched to automated paperless management systems, therefore reviewers need to become competent and computer literate to assist in the evaluation of these automated systems.

4. ANY ADDITIONAL COMMENTS/SUGGESTIONS/IDEAS?

There were no major additional comments submitted by the Government respondents. The industry respondents reiterated the need for more cooperative ventures between Government and industry to enhance cooperation and understanding. Additionally, one respondent commented that some sections of the *Interpretive Guide* contained "negative overtones" which carried over to the review teams when evaluating contractors' MCSs. The respondent recommended making the *Interpretive Guide's* wording more constructive and positive which would promote a healthier attitude when reviews were conducted.

V. CONCLUSIONS AND RECOMMENDATIONS

This chapter summarizes the findings from the Analysis chapter, presents the authors' viewpoints, and provides recommended actions and suggested topics for future research.

This research study generated feedback on two areas. First, respondents assessed the adequacy of the explanations of the C/SCSC elements provided by the *Interpretive Guide*. Second, the respondents were given, through a series of open-ended questions, an opportunity to address the implications of the criteria on the systems acquisition concept, and to suggest any modifications or improvements to the criteria. This second area proved to be of major importance to our research as both, the Government and Industry respondents provided realistic feedback on the overall C/S concept. The following discussion will address both of these issues, beginning with the systems implications of the C/S concept.

Systems Acquisition Implications of C/SCSC

We asked the participants to address the impact of C/SCSC on the system acquisition concept. There was a divergence of opinion between the Government and Industry respondents. Whereas the Government found the criteria concept having a positive effect on system acquisition, the Industry respondents found the implementation of this concept burdensome and expensive. The contractors did agree with the general concept of the criteria however.

We believe this differing of opinion stems from two factors. First, there is still the problem of interpretive differences regarding the intent of the criteria elements between Government and Industry. There is no one best way to set up a contractor's MCS and the explanations provided by the *Interpretive Guide* are advisory rather than being mandatory rules of implementation. Therefore, there are different

expectations as to the true intent of the criteria. Secondly, the roles of Government and Industry differ with respect to the area of performance measurement. The contractor is charged with developing, implementing, and executing a MCS meeting the somewhat ambiguous intent of the C/SCSC. The Government, on the other hand, is charged with oversight responsibility whereby it reviews the contractor's cost and schedule management system to determine if it complies with the criteria.

The contractor contends that it is more challenging to develop and implement a MCS which complies with the criteria concept, whereas the Government believes the challenge lies in reviewing a myriad of different systems and determining if those systems are in compliance with the intent of the criteria. Obviously, more direct communication between the two parties can alleviate some of the hostility which has developed over the different roles of the two parties. Furthermore, these discussions can lead to revision in the *Interpretive Guide* which will reflect a mutual understanding of the intent of the criteria and possibly even improve the Government review process.

Corps of Competent Analysts

The shortfall of the number of experienced analysts has resulted in the Government having to "contract out" many analyst positions. However, it is imperative for the Government to have its own in-house corps of competent analysts. Education is vital to ensure analysts have the tools necessary to review the many different systems used by defense contractors. As the DoD enters an era of downward spiraling budgets, there needs to be some assurance that its funds are being utilized in the most efficient and effective manner possible. Having competent analysts will greatly enhance the quality of the reviews of the contractor's MCSs.

Streamlining of Variance Reporting

Effective and efficient variance reporting procedures are of primary concern to the Government and Industry. For the contractors, the requirement for detailed monthly reporting is time consuming and expensive. As the number of VARs increase, the quality of the actual "analysis" decreases. Reporting just becomes another massive paperwork exercise. For the Government, the task of reviewing these reports, which seldom changes from month-to-month, becomes burdensome with no value being added. Also, as the volume of paperwork increases, it is less likely that the Government personnel will invest the time to review each variance analysis report (VAR).

Summary level reporting would reduce the administrative burden and expense of preparing detailed VARs and allow more time to focus on critical problem areas. Government and Industry personnel should work together to develop mutually agreed upon thresholds for reporting purposes – the quality of reporting would improve and more time could be directed toward resolving the problems.

Evaluation of the Interpretive Guide

The *Interpretive Guide* is unique in that it is one of the few documents available in the acquisition arena which attempts to explain the purpose and intent of the criteria elements. However, if it is to remain a useful document, it must evolve along with the criteria to reflect the dynamic nature of the acquisition environment. The JIG revision will provide an excellent opportunity to update the *Interpretive Guide* to reflect changes in the acquisition community. Appendix A contains by criteria section Government and Industry comments on criteria explanations provided by the *Interpretive Guide*. Particularly noteworthy is the attention given to each section by Industry respondents representing the NSIA. Following is a brief summary of the highlights of the *Interpretive Guide* critique.

One area the *Interpretive Guide* needs to address is the concept of IPTs. As the acquisition arena becomes more streamlined, IPTs will play an integral role in the contractor's organizational structure. The work team concept promotes efficiency in operations by effectively utilizing those resources most critical to getting the job done.

The Analysis section received a substantial amount of attention with the emphasis being on variance reporting. The fact that this issue was addressed here, as well as in the open-ended questions, highlights the amount of interest in this area. As stated earlier, summary level analysis would streamline the variance reporting process, thereby allowing Industry to focus its energies on working critical problem areas. Personnel in the Government program offices would also be relieved of reading voluminous and repetitive reports and be able to work with the contractor to resolve crucial problems.

Based upon the comments received, the Government and Industry respondents generally agreed with the explanations provided by the *Interpretive Guide* for the Accounting and Planning and Budgeting sections. Those comments which were supplied can be attributed to personal preferences concerning the intent of the criteria. One area which did not receive much attention was Revisions. With the number of changes that occur in major programs, it is imperative that the contractor accommodate these changes in an orderly, controlled, and timely manner – consistent with the intent of the criteria.

Recommendations

Although the responses did not provide any clear lines of interpretive differences between the Government and Industry, they did provide a number of worthy comments to benefit the text of the *Interpretive Guide*. The respondent's inputs to

the criteria provide a springboard for improvements to future editions of the *Interpretive Guide*.

Many insightful pieces of information are contained in the respondents' comments that can be applied to future revisions of the text. However, due to the current revision of the JIG, we suggest that a complete update of the *Interpretive Guide* be delayed until the JIG is in its final format.

In the bullets below we point out some of the recommended improvements that can be made to the *Interpretive Guide*, but we feel that much more can be extracted from the professionals on the AFIT staff who are responsible for its upkeep and for educating the students in the performance management discipline.

- Update the text to include the modern management practices that are being used in Industry as well as the Government; this includes IPTs, and work teams in general.
- We also agree with the comments provided by some of the Industry members; the *Interpretive Guide*'s text should be written from a different approach so that it does not promote "an auditor's" mentality to those who read it. This is especially true for those individuals who use the *Interpretive Guide* as a handbook for conducting reviews of contractor's management control systems. Government review members who maintain a more neutral frame of reference during the review have a better opportunity for performing an unbiased analysis of the MCS, and hopefully conduct a more accurate review.
- Update the *Interpretive Guide* to reflect the need for summary level reporting for variance analysis.

We also suggest continuing the annual meetings between the Government and Industry to discuss the current "hot" issues in the performance management discipline and the C/SCSC itself. The joint Government/Industry forum can be used to discuss new and prospective policy changes, management practices, as well as to openly discuss criteria interpretive differences between the parties. The forum should encourage participation from DoD review directors and team chiefs, DCAA

and DCMC management personnel, as well as policy makers and educational leaders within the DoD. Industry performance management professionals should also be encouraged to participate.

Further Research

The dynamic environment of the DoD community dictates the need for continued research in the field of performance management. Not only must the DoD more effectively manage its decreasing amount of major acquisition systems, it needs to better understand the vital business practices and MCSs employed by its contractors. Following are possible areas for further research on performance management to help achieve these goals:

- Conduct a follow-on study to determine how changes to the JIG have affected the area of performance measurement.
- Conduct a similar study of Government and Industry personnel; however restrict the research questionnaire to more open-ended questions. This will give the respondents more latitude to discuss their viewpoints and generate more original feedback.
- Conduct a study of demonstration and subsequent application reviews performed by the different services and Government agencies (i.e., DCAA, DCMC). Determine if the criteria are being applied consistently across the DoD.
- Initiate a cross-sectional study of selected contractor management control systems. Determine how Government personnel can best review the myriad of systems currently used in practice.
- A follow-on research questionnaire should be developed and forwarded to Government agencies. This would provide the opportunity to improve upon the low Government response rate for this research effort and provide a better indication of how they view the explanations offered in the *Interpretive Guide*.

In pursuing research into any of the above areas, we suggest that the research be broken out into various categories if at all possible. Some of the different categories could be: the type of system being acquired (such as an aircraft, satellite,

ship, armored vehicle, munitions, et cetera), the Service of the acquiring agency, and the dollar value of the contract. This study may unveil some new information concerning similarities or differences in the application of the criteria on large scale acquisition systems.

Closing Comments

C/SCSC does not represent a MCS. The criteria specify the minimum requirements a contractor's MCS must satisfy. The quality of the responses received from the Government and Industry reflect the importance of the criteria in the acquisition community. The NSIA respondents, representing Industry, were particularly supportive of this research effort. They viewed this study as a way to contribute to Government instructional performance measurement courses and to voice their opinions concerning the criteria with the hope that their comments might be incorporated into the JIG revision.

Although the military budget is shrinking, substantial sums are still being invested to maintain our defense capability. Therefore, the need still exists for the contractor to have adequate cost and schedule controls in place to mitigate Government risk. The C/SCSC concept was designed to ensure that the contractor's MCS provides timely and reportable information to the Government on a recurring basis. The *Interpretive Guide* was developed to facilitate understanding the purpose and intent of the criteria. To remain useful, the *Interpretive Guide* must remain dynamic and flexible enough to capture the ongoing changes in the acquisition environment.

APPENDIX A

INTERPRETIVE GUIDE RESPONSES

Responses we received concerning the interpretation of the criteria from the *Interpretive Guide* are presented in this appendix. The text of the *Interpretive Guide* is also presented here. The responses have been placed together with the corresponding text of the *Interpretive Guide*. A table of contents listing the page numbers where each criterion can be found begins on page A-3.

The criteria and their respective levels of checklist questions are presented with the interpretation provided from the *Interpretive Guide*. The information presented from the *Interpretive Guide* is identified by the preceding phrase, "IntGd Text".

Responses from U.S. Government personnel are identified by the letter "G" in the left column of the first paragraph and industry responses are identified similarly by the letter "I" (for example, a response from Government respondent number one would be identified by *G1 Interpretation*:; and a response from the third industry respondent would be identified by *I3 Interpretation*:).

Respondents agreeing with the *Interpretive Guide*'s explanation of an item is identified by the word "O.K." after the respondents' identifier.

**INTERPRETIVE GUIDE
TO THE EVALUATION/DEMONSTRATION
REVIEW CHECKLIST FOR C/SCSC
(APPENDIX E, JOINT IMPLEMENTATION GUIDE)**

This Guide represents the effort of numerous people over the years. It is intended as a teaching tool in the C/SCSC courses offered at AFIT. Comments on recommended revisions to the material contained herein should be addressed as shown in the preface to this volume.

January 1994

Air Force Institute of Technology
Wright-Patterson AFB, Ohio 45433-7765

This document evolved as an instructional reference for use in Air Force Institute of Technology courses of instruction in Cost/Schedule Control System Criteria (C/SCSC). It is intended as an interpretive guide to facilitate the learning process of the criteria promulgated in DODI 5000.2 and the policy contained in the C/SCSC Joint Implementation Guide. This document is the interpretation of the faculty and is not intended for contractual application or as statement of Department of Defense intent.

Appendix A Contents

	<u>Page</u>
I. Organization Criteria.....	A-7
1. DEFINE ALL THE AUTHORIZED WORK AND RELATED RESOURCES TO MEET REQUIREMENTS OF THE CONTRACT, USING THE FRAMEWORK OF THE CWBS.	A-7
2. IDENTIFY THE INTERNAL ORGANIZATIONAL ELEMENTS AND THE MAJOR SUB-CONTRACTORS RESPONSIBLE FOR ACCOMPLISHING THE AUTHORIZED WORK.....	A-15
3. PROVIDE FOR THE INTEGRATION OF THE CONTRACTOR'S PLANNING, SCHEDULING, BUDGETING, WORK AUTHORIZATION, AND COST ACCUMULATION SYSTEMS WITH EACH OTHER, THE CWBS AND THE ORGANIZATION STRUCTURE. (Reference format 1.)	A-19
4. IDENTIFY THE MANAGERIAL POSITIONS RESPONSIBLE FOR CONTROLLING OVERHEAD (INDIRECT COSTS).	A-22
5. PROVIDE FOR INTEGRATION OF THE CWBS WITH THE CONTRACTOR'S FUNCTIONAL ORGANIZATIONAL STRUCTURE IN A MANNER THAT PERMITS COST AND SCHEDULE PERFORMANCE MEASUREMENT FOR CWBS AND ORGANIZATIONAL ELEMENTS. (Provide matrix showing integration.).....	A-26
II. Planning and Budgeting Criteria	A-31
1. SCHEDULE THE AUTHORIZED WORK IN A MANNER WHICH DESCRIBES THE SEQUENCE OF WORK AND IDENTIFIES THE SIGNIFICANT TASK INTER-DEPENDENCIES REQUIRED TO MEET THE DEVELOPMENT, PRODUCTION, AND DELIVERY REQUIREMENTS OF THE CONTRACT.....	A-31
2. IDENTIFY PHYSICAL PRODUCTS, MILESTONES, TECHNICAL PERFORMANCE GOALS, OR OTHER INDICATORS THAT WILL BE USED TO MEASURE OUTPUT.....	A-36
3. ESTABLISH AND MAINTAIN A TIME-PHASED BUDGET BASELINE AT THE COST ACCOUNT LEVEL AGAINST WHICH CONTRACT PERFORMANCE CAN BE MEASURED. INITIAL BUDGETS ESTABLISHED FOR THIS PURPOSE WILL BE BASED ON THE NEGOTIATED TARGET COST. ANY OTHER AMOUNT USED FOR PERFORMANCE MEASUREMENT PURPOSES MUST BE FORMALLY RECOGNIZED BY BOTH THE CONTRACTOR AND THE GOVERNMENT. (Reference formats 2 and 8.)	A-39
4. ESTABLISH BUDGETS FOR ALL AUTHORIZED WORK WITH SEPARATE IDENTIFICATION OF COST ELEMENTS (LABOR, MATERIAL, ETC.) (Reference formats 2, 3, and 4.)	A-46

	<u>Page</u>
5. TO THE EXTENT THE AUTHORIZED WORK CAN BE IDENTIFIED IN DISCRETE, SHORT-SPAN WORK PACKAGES, ESTABLISH BUDGETS FOR THIS WORK IN TERMS OF DOLLARS, HOURS, OR OTHER MEASURABLE UNITS. WHERE THE ENTIRE COST ACCOUNT CANNOT BE SUBDIVIDED INTO DETAILED WORK PACKAGES, IDENTIFY THE FAR TERM EFFORT IN LARGER PLANNING PACKAGES FOR BUDGET AND SCHEDULING PURPOSES. (Reference format 6.)	A-52
6. PROVIDE THAT THE SUM OF ALL WORK PACKAGE BUDGETS PLUS PLANNING PACKAGES WITHIN A COST ACCOUNT EQUALS THE COST ACCOUNT BUDGET. (Reference format 2).....	A-60
7. IDENTIFY RELATIONSHIPS OF BUDGETS OR STANDARDS IN UNDERLYING WORK AUTHORIZATION SYSTEMS TO BUDGETS FOR WORK PACKAGES.	A-61
8. IDENTIFY AND CONTROL LEVEL OF EFFORT ACTIVITY BY TIME-PHASED BUDGETS ESTABLISHED FOR THIS PURPOSE. ONLY THAT EFFORT WHICH CANNOT BE IDENTIFIED AS MEASURED EFFORT OR AS APPORTIONED EFFORT WILL BE CLASSED AS LOE. (Reference format 6.).....	A-63
9. ESTABLISH OVERHEAD BUDGETS FOR THE TOTAL COSTS OF EACH SIGNIFICANT ORGANIZATIONAL COMPONENT WHOSE EXPENSES WILL BECOME INDIRECT COSTS. REFLECT IN THE CONTRACT BUDGETS AT THE APPROPRIATE LEVEL, THE AMOUNTS IN OVERHEAD POOLS THAT WILL BE ALLOCATED TO THE CONTRACT AS INDIRECT COSTS. (Reference DCAA Audit Manual and FAR 31.203) (Reference format 7.).....	A-66
10. IDENTIFY MANAGEMENT RESERVES AND UNDISTRIBUTED BUDGET ...	A-74
11. PROVIDE THAT THE CONTRACT TARGET COST PLUS THE ESTIMATED COST OF AUTHORIZED BUT UNPRICED WORK IS RECONCILED WITH THE SUM OF ALL INTERNAL CONTRACT BUDGETS AND MANAGEMENT RESERVES. (Reference formats 3, 4, and 5.)	A-77
 III. Accounting Criteria.....	 A-80
1. RECORD DIRECT COSTS ON AN APPLIED OR OTHER ACCEPTABLE BASIS CONSISTENT WITH THE BUDGETS IN A FORMAL SYSTEM THAT IS CONTROLLED BY THE GENERAL BOOKS OF ACCOUNT.....	A-80
2. SUMMARIZE DIRECT COSTS FROM THE COST ACCOUNTS INTO THE WBS WITHOUT ALLOCATION OF A SINGLE COST ACCOUNT TO TWO OR MORE WBS ELEMENTS. (Reference format 3.).....	A-82
3. SUMMARIZE DIRECT COSTS FROM THE COST ACCOUNTS INTO THE CONTRACTOR'S FUNCTIONAL ORGANIZATIONAL ELEMENTS WITHOUT ALLOCATION OF A SINGLE COST ACCOUNT TO TWO OR MORE ORGANIZATIONAL ELEMENTS. (Reference format 4.).....	A-83
4. RECORD ALL INDIRECT COSTS WHICH WILL BE ALLOCATED TO THE CONTRACT.....	A-84

	<u>Page</u>
5. IDENTIFY THE BASES FOR ALLOCATING THE COST OF APPORTIONED EFFORT.....	A-87
6. IDENTIFY UNIT COSTS, EQUIVALENT UNIT COSTS, OR LOT COSTS AS APPLICABLE.....	A-88
7. THE CONTRACTOR'S MATERIAL ACCOUNTING SYSTEM WILL PROVIDE FOR ACCURATE COST ACCUMULATION AND ASSIGNMENT OF COSTS TO COST ACCOUNTS IN A MANNER CONSISTENT WITH THE BUDGETS USING RECOGNIZED, ACCEPTABLE COSTING TECHNIQUES; DETERMINATION OF PRICE VARIANCES BY COMPARING PLANNED VERSUS ACTUAL COMMITMENTS, COST PERFORMANCE MEASUREMENT AT THE POINT IN TIME MOST SUITABLE FOR THE CATEGORY OF MATERIAL INVOLVED, BUT NO EARLIER THAN THE TIME OF ACTUAL RECEIPT OF MATERIAL; DETERMINATION OF COST VARIANCES ATTRIBUTABLE OF THE EXCESS USAGE OF MATERIAL, DETERMINATION OF UNIT OR LOT COSTS WHEN APPLICABLE, AND FULL ACCOUNTABILITY FOR ALL MATERIAL PURCHASED FOR THE CONTRACT INCLUDING THE RESIDUAL INVENTORY.....	A-90
 IV. Analysis Criteria.....	 A-95
1. IDENTIFY AT THE COST ACCOUNT LEVEL ON A MONTHLY BASIS USING DATA FROM, OR RECONCILABLE WITH, THE ACCOUNTING SYSTEM; BCWS AND BCWP; BCWP AND APPLIED (ACTUAL WHERE APPROPRIATE) DIRECT FOR THE SAME WORK; VARIANCES RESULTING FROM THE ABOVE COMPARISONS CLASSIFIED IN TERMS OF LABOR, MATERIAL, OR OTHER APPROPRIATE ELEMENTS, TOGETHER WITH THE REASONS FOR THE SIGNIFICANT VARIANCES....	A-95
2. IDENTIFY ON A MONTHLY BASIS, IN THE DETAIL NEEDED BY MANAGEMENT FOR EFFECTIVE CONTROL, BUDGETED INDIRECT COSTS, ACTUAL INDIRECT COSTS, AND VARIANCES, ALONG WITH THE REASONS. (Reference format 7).....	A-106
3. SUMMARIZE THE DATA ELEMENTS AND ASSOCIATED VARIANCES LISTED IN ITEMS 1 AND 2 ABOVE THROUGH THE CONTRACTOR ORGANIZATION AND WBS TO THE REPORTING LEVEL SPECIFIED IN THE CONTRACT. (Reference formats 2, 3, 4, and 5.)	A-111
4. IDENTIFY ON A MONTHLY BASIS SIGNIFICANT DIFFERENCES BETWEEN PLANNED AND ACTUAL SCHEDULE ACCOMPLISHMENT TOGETHER WITH THE REASONS.....	A-115
5. IDENTIFY MANAGERIAL ACTIONS TAKEN AS A RESULT OF CRITERIA ITEMS 1 THROUGH 4 ABOVE.	A-117

Page

6. BASED ON PERFORMANCE TO DATE, ON COMMITMENT VALUES FOR MATERIAL, AND ON ESTIMATES OF FUTURE CONDITIONS, DEVELOP REVISED ESTIMATES OF COST AT COMPLETION FOR WBS ELEMENTS IDENTIFIED IN THE CONTRACT AND COMPARE THESE WITH THE CONTRACT BUDGET BASE AND THE LATEST STATEMENT OF FUNDS REQUIREMENTS REPORT TO THE GOVERNMENT. (Reference formats 2, 3, 4, 5, 10, and 11.)	A-119
V. Revisions Criteria A-132	
1. INCORPORATE CONTRACTUAL CHANGES IN A TIMELY MANNER, RECORDING THE EFFECTS OF SUCH CHANGE IN BUDGETS AND SCHEDULES. IN THE DIRECTED EFFORT BEFORE NEGOTIATION OF A CHANGE, BASE SUCH REVISIONS ON THE AMOUNT ESTIMATED AND BUDGETED TO THE FUNCTIONAL ORGANIZATIONS.	A-132
2. RECONCILE ORIGINAL BUDGETS FOR THOSE ELEMENTS OF THE WBS IDENTIFIED AS PRICE LINE ITEMS IN THE CONTRACT, AND FOR THOSE ELEMENTS AT THE LOWEST LEVEL OF THE DOD PROJECT SUMMARY WBS, WITH CURRENT PERFORMANCE MEASUREMENT BUDGETS IN TERMS OF CHANGES TO THE AUTHORIZED WORK AND INTERNAL REPLANNING IN THE DETAIL NEEDED BY MANAGEMENT FOR EFFECTIVE CONTROL. (Reference formats 8 and 9).	A-136
3. PROHIBIT RETROACTIVE CHANGES TO RECORDS PERTAINING TO WORK PERFORMED THAT WILL CHANGE PREVIOUSLY REPORTED AMOUNTS FOR DIRECT COSTS, INDIRECT COSTS, OR BUDGETS, EXCEPT FOR CORRECTION OF ERRORS AND ROUTINE ACCOUNTING ADJUSTMENTS.	A-137
4. PREVENT REVISIONS TO THE CONTRACT BUDGET BASE EXCEPT FOR GOVERNMENT DIRECTED CHANGES TO THE CONTRACTUAL EFFORT.	A-139
5. DOCUMENT INTERNALLY, CHANGES TO THE PERFORMANCE MEASUREMENT BASELINE AND, ON A TIMELY BASIS, NOTIFY THE PROCURING ACTIVITY THROUGH PRESCRIBED PROCEDURES.	A-141
6. PROVIDE THE CONTRACTING OFFICER AND DULY AUTHORIZED REPRESENTATIVES ACCESS TO ALL OF THE FOREGOING INFORMATION AND SUPPORTING DOCUMENTS.	A-144

I. ORGANIZATION

I3 Comments:

The Cost/Schedule Control Systems Criteria (C/SCSC) represent a set of management principles that the Department of Defense has determined its contractors' systems should meet. Since principles, or beliefs, are not purely quantifiable, the criteria has been subject to interpretation since its inception. The C/SCSC Joint Implementation Guide (JIG) was published to provide uniform interpretive guidance to those charged with that responsibility. Over the years many people have come to depend upon the checklist questions contained in the JIG as a means of determining compliance with the criteria. This has led to a belief, that is all too common but incorrect, that the checklist questions are part of the criteria. In reality, the questions associated with each criterion are simply there to help determine compliance with the criterion itself. Since interpretation of the criteria is the true task at hand, that is where the effort in this input is aimed. Furthermore, since the checklist questions are not part of the criteria, they are not included [in my inputs].

Although frequently given less emphasis than the other sections of the Criteria, Organization is the section that ensures that a framework exists for everything else. By working through the organization criteria, one is assured that the entire scope of work has been identified and defined in terms of the stability of the Work Breakdown Structure, and assigned in terms of the contractor's internal management structures and procedures. The organization of the work is the foundation for literally everything else.

While reviewing the following interpretations, keep in mind that the criteria are used against the management control systems and procedures described in the System Description. They are not used against the contract or the data; however, the data are used to verify that the systems and procedures are being used as described.

- 1. DEFINE ALL THE AUTHORIZED WORK AND RELATED RESOURCES TO MEET REQUIREMENTS OF THE CONTRACT, USING THE FRAMEWORK OF THE CWBS.**

IntGd Text

Of foremost importance in organizing any "major" acquisition program is establishing all the work parameters that will be required to accomplish that program. As part of this effort it is also essential to define all the resources that will be required to accomplish that scope of work. C/SCSC requires that this be done and that a Contract Work Breakdown Structure (CWBS) be used as the vehicle for this work and resource definition. When completed, the CWBS will provide a framework for various and extensive management and control purposes. The CWBS will be used in source selection for example, to compare the way each contractor is proposing to accomplish the work outlined in the solicitation specifications. The CWBS will also be used in negotiations to establish the fair and reasonable cost of resources needed to accomplish the contract effort. And the CWBS will be used as the beginning point for all work task planning, the assignment of work to responsible organizations, work authorizing, scheduling, budgeting, cost accumulation, performance analysis, and revisions to planning. Lastly,

the CWBS will provide the framework for data/information reporting. Hence the CWBS is, perhaps, the single most important document/exhibit prepared in support of the C/SCSC. Any weakness in the CWBS can have far-reaching and debilitating effects upon performance measurement and contract accomplishment.

G2 Interpretation:

How far down does the CWBS go? What does/should an RFP include in relation to the CWBS?

G6 Interpretation: O.K.

I3 Interpretation:

There are four distinct elements to be considered when thinking about this criterion: (1) Defining all work, (2) Related resources, (3) The contract requirements, and (4) the CWBS. However, the primary intent of this criterion is centered on the CWBS and its use as the framework for the other three elements. DoD has established, and requires the use of, a military standard WBS, MIL-STD-881. The use of a common WBS as a starting point for the CWBS is an important part of the communication between the government program office and the contractor. Such common ground for communication when used properly and consistently will minimize the degree of misunderstanding and will greatly enhance the common goals of all concerned. With such importance placed on the framework of the CWBS, it is a reasonable conclusion that the totality of work contained in the contract, and the resources necessary to accomplish that work, should be defined within the framework of the CWBS.

One major benefit of using a product oriented CWBS is in terms of program stability. The CWBS will remain constant throughout the life of the contract, with the exception of increasing detail as it is known and changes in the scope of work that come from contract changes. This stability will continue in spite of organizational changes, funding changes, or almost any of the other normal dynamics of a DoD program.

It should be noted that this criterion does not require the use of a MIL-STD-881 (latest revision) compliant CWBS; nor does any other criterion contain such a requirement. In other words, the C/SCSC itself does not require the CWBS to be within the guidelines of MIL-STD-881; that requirement comes from other sources. For example, the DFAR contract clause usually requires implementation in compliance with the C/SCSC *Joint Implementation Guide*, which defines CWBS as "...within the guidelines of MIL-STD-881 (latest revision)...". This may be a small point, but such subtleties are highly likely to be discussed during a demonstration review, and have in the past created excessive discussion due to the lack of understanding.

A CWBS Dictionary is needed to provide the definitions and content of the many CWBS elements. The most common way to verify that all work is included in the CWBS is to verify that all SOW tasks, and technical specifications if known, are included in the CWBS Dictionary. The process of cross-referencing the source of the work descriptions in the contract SOW with the descriptions contained in the CWBS Dictionary provides the verification that in fact all work is included, including that work which is to be completed by subcontractors. When a CWBS is properly constructed, in-house and outside work should be clearly identifiable. Those elements that are subcontracted should include the names of the subcontractors as soon as known.

The CWBS is generally the structure used for reporting in format 1 of the CPR. The CDRL, DD Form 1423, is the form used to establish the reporting requirement. The recommended reporting level is level 3 of the Prime Mission Equipment legs of the CWBS and level 2 for the remainder, but there is no formal restriction. In reality, the level of reporting is determined as part of the contract negotiation, and should be clearly identified on the CWBS.

I4 Interpretation:

Current interpretation is good. There are some things that might want to be considered as additions. First, that the CWBS is good only through the cost account level. The CWBS at that point loses part identification and becomes organizationally identified. Also there is the subject of work teams. Currently, contracts are requiring more work team reporting that is NOT CWBS oriented.

I6 Interpretation:

Agree with intent statement, as written. NOTE: Supplemental Guidance #06, issued by the PMJEG on 5/13/91, had some impact on Chapter 3 of the Joint Implementation Guide, which, of course, affects Appendix E. Paragraphs 3-2 and 3-2a were revised to delete all references to MIL-STD-881, except to reference the standard in paragraph 3-2. In addition, paragraphs 3-2b and 3-2c were revised to replace the word "functional" manager with the word "responsible" manager. In paragraph 3-2a, the reference to contract line items was deleted. Unfortunately, the corresponding check list questions were not revised in consonance with the JIG revisions in some cases (such as this) but should have been, as my comments below will indicate.

I7 Interpretation:

I agree with the intent statement made in the write-up. It should also stress that the CWBS must be a breakdown of "deliverable" products, not organizational, resources, nor process elements. It should include all deliverable items, not just hardware or software, such as reports, specifications, appropriate meetings and reviews.

CHECKLIST QUESTIONS:

- a. Is only one CWBS used for the contract (attach copy of CWBS)?

IntGd Text

Only one CWBS be used for a given contract. That CWBS must be the one that was negotiated and agreed upon as the definition of the work and resources required to meet the requirements of the contract. It would be devastating to performance measurement if one CWBS was used to manage the contract but a different CWBS was used to report data to the government. This would negate any effectiveness inherent in the C/SCSC and would defeat the overall purpose of a common basis for communication. In this regard, program revisions often invite the occurrence of multiple CWBSs.

It is unacceptable to utilize more than a single CWBS on any contract.

G1 Interpretation:

Only one CWBS may be used at one time for any program or contract. The current CWBS should be the latest negotiated to meet the contract requirements. As a program changes a

revised CWBS may be necessary. However, the contractor should continue to report and manage to the current, negotiated CWBS until the contract is formally modified. Changes to the CWBS over the life of a contract should be minimal in order to obtain auditable, reliable cost and schedule performance data. This is why it is imperative that a lot of pre-award effort be made by the government team to determine what the CWBS should be for the life of the contract. Up front planning will pay off in the long term and will result in reliable, traceable cost and schedule data.

G2 Interpretation:

As of now the CWBS is a primary management tool. It appears however that in the near future we will still have CWBS reporting Format 1, but a revised Format 2 by Integrated Product Teams will be the primary management sort of contract data.

G3 Interpretation:

It is my understanding that it is not unacceptable to use more than one CWBS on a contract if the efforts are totally dissimilar or the efforts must be tracked separately. Examples of these situations are as follows:

1. Dissimilar efforts: A contract is awarded to develop a new aircraft. Later on this contract is used as the contractual vehicle to procure the development work for a future aircraft mod program. The efforts are dissimilar and require separate CWBSs and separate reporting.
2. A single contract is used to procure 2 lots of aircraft. Since the two lots are separate contract actions on a single contract, there are really two CWBSs and each lot is reported on separately.

The emphasis in this question needs to be on only one CWBS used to manage the project and report the data regardless of how many separate efforts are on the contract.

Revise third sentence to read: "This cannot be possible unless the single WBS for a particular contract effort includes... ."

G6 Interpretation: O.K.

I4 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

I agree with the statement as written, EXCEPT that the CWBS should NOT define the resources required to complete the contract. It should clearly identify the products, those elements to be subcontracted out, and all related tasks associated with contract completion. To infer that the CWBS must identify resources required or to be used constrains the contractor in such a way that management of critical path activities, effective use of resources and the like would most likely not be able to be accomplished.

b. Is all contract work included in the CWBS?

IntGd Text

A Work Breakdown Structure (WBS) is a product-oriented, "family-tree" chart which displays and defines the hardware, software, services, and other work tasks needed to produce a given product. In the case of a CWBS, the product(s) are specified in the contract. The CWBS is used to insure that the contractor and the government have a common basis for communication regarding cost, schedule, and technical performance with respect to the contract scope of work. This cannot be possible unless the "single" WBS for the contract includes all the tasks, services, hardware components, and subcontracted items that are required to perform under the contract. To confirm mutual understanding of the complete scope of work contained in the CWBS it is necessary to define each CWBS element clearly. These definitions are set forth in a CWBS Dictionary to insure that both parties understand the composition of each CWBS element and its unique portion of the scope of work. By necessity then, the CWBS must always be all-inclusive. The summation of data from the CWBS elements must always reflect the amount of work authorized on the contract. The total amount of budget allocated for the work accomplishment will flow logically from the definitized WBS.

G1 Interpretation:

The CWBS must be structured in such a manner as to capture the entire scope of work of the contract. The CWBS will be the communication mechanism between the government and the contractor as to the cost and schedule performance of the contract. The CWBS Dictionary serves as the definition of the CWBS as agreed to by both the contractor and the government. It will contain a matrix to show that all contract line items and statement of work paragraphs have been addressed in the CWBS.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

I agree with the interpretation as written but feel that it should be expanded to include ALL the "deliverable" products related to the contract including reports, documentation, specifications, drawings, meetings, reviews and so on.

- c. Are the following items included in the CWBS? (annotate copy of CWBS to show elements below)

G2 Interpretation:

This item has always been questionable as to who should "annotate" -- the contractor in the WBS and Dictionary or the Government team when doing a Demo, ESAR, or SAR. The DID for the WBS is also not clear or specific as to C(1), C(2), and C(3). Suggest the WBS DID

should be enhanced (DI MGMT 81334). The current DID does not address subcontractors or "cost account".

(1) Contract line items and end items (if in consonance with MIL-STD-881 (latest edition))?

I ntGd Text

All products and services identified as contract line items and/or end items in the contract scope of work must be contained in the CWBS. Often the names of the CWBS elements directly correlate with the contract line or end items. However, it is feasible that a single CWBS element may contain a number of products and services that were identified as contract line items or end items. It is important in these cases to be able to recognize these products or services (the line items or end items) within the CWBS definitions. Specific cost, schedule, and technical progress will be mandated for these items. If they cannot be specifically and individually identified in the CWBS their progress cannot be effectively measured.

G1 Interpretation:

Identification of the contract line items and the end items in the CWBS will permit easy identification and measurement of cost and schedule performance data relative to the products and services required in the contract.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation:

Current interpretation is marginal. There is an issue of contract line items and end items that causes some confusion. To "price" an end item, the contractor may allocate the cost in certain CWBS elements based on a rationing concept. A good example is program management and systems engineering which are generally not separately priced but must in some manner be included in the priced line items. The current interpretation addresses ensuring that the line item schedules are in the CWBS, but does not address the issue of the CWBS feeding some line item.

I6 Interpretation:

Revise the question to read: "End items (if in consonance with MIL-STD-881 (latest edition))". If the end items are not in consonance with MIL-STD-881, it must be with the concurrence of the Government Program Manager. Deleting the reference to contract line items makes sense, because CLIN structures do not always represent the way the work will be done, nor do they always map directly into the CWBS, because CLINs are contract and billing-related, rather than work performance-related.

I7 Interpretation:

What about not in consonance with MIL-STD-881? The CWBS should also identify special structural requirements such as Integrated Product or Work Teams.

(2) All CWBS elements specified for external reporting?

IntGd Text

Within the CWBS, certain higher level elements are selected by the government for which the contractor is required to report on a regular basis cost, schedule and technical specification status. In some cases these elements may correspond with all the elements at a given level of the CWBS. Hence data for all the lower level elements would be summarized correspondingly to these higher level elements where it would then be reported. This situation most often occurs where all the contract line items and end items occur at the specified reporting level or higher. Where contract line items happen to fall at various levels within the CWBS, however, it would not suffice to require data reporting at a particular level of the CWBS. Rather, the individual CWBS for which data will be required must be separately identified. In either case it is important to note which CWBS elements will be specified for external reporting, so there is no doubt as to the lower level elements which be summarized within them. It is only in this way that reported data can be audited for cause and effect relationships and validity reconciliation.

G1 Interpretation:

It is necessary to identify the level of CWBS reporting for each WBS.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation:

Current interpretation is good. However, I believe the most critical reason for asking for multi-level reporting is that there are critical elements generally under the product leg of the CWBS that are of interest to government managers that need lower level reporting, while elements of program management and systems engineering are generally LOE, do not drive the program's cost and therefore are reported at a higher level.

I6 Interpretation:

As stated above, contract line items should not drive reporting levels. CLINs are related to billing, and are not necessarily connected to the reporting of work performance.

I7 Interpretation: O.K.

(3) All CWBS elements to be subcontracted, with identification of subcontractors?

IntGd Text

All CWBS work tasks or services that are outside of the capability of the contractor to provide himself must be clearly identified on the CWBS. In some cases, a contractor may have the capability to do all the work on a contract himself, but there may be various reasons of economy that may warrant subcontracting certain of the CWBS elements for accomplishments. But for whatever reason, when defining the work and service

requirements of a contract, it is important to clearly identify those CWBS elements which will be subcontracted. As soon as the subcontractors are identified, the CWBS should be augmented with their names. Such identification will facilitate the interpretation of data reported by the prime contractor and better allow for total contract progress measurement.

G1 Interpretation:

It is important to identify those CWBS elements that are contracted out in order to properly perform performance measurement.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation:

Current interpretation is marginal. The concern is the definition of subcontract. The current interpretation may allow the conclusion that purchase parts would be "subcontract effort". I would suggest that the interpretation needs to emphasize critical components that require significant outside development work.

I6 Interpretation: O.K.

I7 Interpretation:

I agree that CWBS elements should identify elements where subcontracted effort will take place. I disagree with identifying the subcontractors in the contractual levels of the CWBS. Since a prime contractor is responsible for the integration of subcontractor data into the C/SCS reports, I see no value added in supplier identity in the CWBS and doing so might limit a prime contractor from taking corrective (termination) action when a subcontractor fails to perform.

(4) Cost account levels?

IntGd Text

The systematic breakdown of the contract products and services within the CWBS framework should continue with an orientation to the deliverable products until the contract scope has been subdivided (within each branch of the structure) to the level where the contractor's management organization is able to assign responsibility for performance to individual managers. These responsibility assignments must relate directly to the functional capability of the manager, and to the CWBS elements product or service. These individual elements are called cost accounts. The cost account is the focal point of control within C/SCSC. The cost account must have a well-defined scope of work which is directly relatable to the definition of the higher level CWBS element of which it is a part. Each cost account must have a time-phased budget and a detailed schedule for the effort within the cost account. The budget and schedule are relatable to, and in support of, the contract's performance measurement baseline and the master program schedule. A cost account must be assigned to a single individual for the control of resources and the direction of effort to be accomplished. For this reason, it is of paramount importance that the CWBS include and identify where the cost accounts

occurs within the total work definition.

G1 Interpretation:

Cost accounts are the point of control and communication with the C/SCSC. Responsibility assignment matrixes will show the functional area of responsibility and the related CWBS for all cost account managers. Cost accounts must directly relate to a higher level CWBS, have its own earned value methodology, and have its own budget.

G6 Interpretation: O.K.

I4 Interpretation:

Current interpretation is dated. There needs to be an update to include the concept of work teams where a team is responsible not an individual. This leads to the understanding that the company's organization may be a flexible structure not necessarily a rigid matrix organization. Also that a cost account may be a team consisting of a collection of organizational resources, and not necessarily restricted to one organizational resource.

I6 Interpretation:

The PMJEG Supplemental Guidance #6 (referenced above) which replaces functional manager with responsible manager, impacts this question as well as the questions related to criteria 2 and 3, which follow. Your interpretation, when discussing responsibility assignments, refers to the "functional capability of the manager", rather than the capability of the responsible manager. Focusing on the functional manager does not address the issues of implementing Integrated Product Development Teams (IPDT), work team leaders, and cross-functional work teams. With the increased emphasis on IPDTs, shouldn't the check list begin to reference the team leaders' roles and responsibilities?

I7 Interpretation:

I agree with the write-up to the extent that the CAP identity is part of the extended CWBS (internal to the contractor and available for review purposes) but not part of the contractual CWBS. If CAP identity becomes part of the contractual levels of the CWBS, is the customer relieving the contractor of responsibility and accountability in managing the activities for the contract?

2. IDENTIFY THE INTERNAL ORGANIZATIONAL ELEMENTS AND THE MAJOR SUB-CONTRACTORS RESPONSIBLE FOR ACCOMPLISHING THE AUTHORIZED WORK.

IntGd Text

Once the scope of work has been adequately defined via the CWBS it is important to assign responsibility for getting the work accomplished as defined. This criteria requirement serves to insure that the contractor reviews his manpower availability and the availability of his managerial personnel to ascertain to what extent these personnel have the time and the capability to assume responsibility for additional contract work.

The task of composing an organizational chart (or Organization Breakdown Structure - OBS) to identify which managers in the corporate structure will have responsibility for work accomplishment will usually suffice as a review to ensure that full management and technical capability exists. Where management, manpower or technical capacity is not sufficient, the contractor must choose between the options of subcontracting for this additional capability or trying to hire additional personnel as a means of increasing his own capacity. Such a make-or-buy decision is often a hard choice to make because of the far-reaching effects it may have on the growth potential of the company, the company's overhead posture, and the competitive environment in which the company operates. The necessity to identify organizational responsibility can not be minimized. Done improperly or insufficiently at the onset of a contract, it almost always result in lack of management control, lack of scheduled accomplishments and cost overruns.

G2 Interpretation:

This criteria interpretation as to Organizational Breakdown Structure (OBS) could also be enhanced as to Integrated Product Teams.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I3 Interpretation:

The intent here is to verify that a formal authorization chain exists for the purpose of accomplishing work. This is the heart of the idea behind the term control systems, as in Cost/Schedule Control Systems Criteria. Control is exercised by assigning responsibility, accountability, and authority to individuals within the contractor's organization. The relationships between these individuals are defined and displayed through the use of an Organizational Breakdown Structure (OBS). As in a military chain of command, or the chain of evidence in police work, if the chain is broken, or not clearly linked, the purpose behind the chain will not be realized.

With the use of Work Teams, the growing popularity of matrix organizations, and the competitive pressure to be constantly reducing cost, this may be the most difficult criterion to understand and verify; however, it must be done. The primary objective is to verify that a formal process is in place and being used to identify the authorization chain and thereby the organizational elements with responsibility. The CWBS discussed in the first criterion is used to structure the work, the OBS discussed here is used to define the people responsible for the work, from the Program Manager down to the lowest level of management responsibility.

When considering the organizational elements responsible for the work, it is important to identify that work that is subcontracted. Some companies identify such work as separate CWBS and OBS elements, although that is not a requirement of the C/SCSC, it merely makes identification more clear.

The importance of the OBS should not be underestimated. Such issues as labor availability, including management, and space limitations are among the considerations that the company must review when deciding the mix of in-house and subcontracted work. Once these decisions are made, the responsibility must be clearly assigned. Corporate policy usually dictates the procedures to be used when assigning that responsibility, but they should also be summarized in

the system description.

I4 Interpretation:

This interpretation is dated. The assumption written into the interpretation is that the contractor has a set organization into which the contract is assigned. Current team management philosophy encourages flexible organizations that are formed to fit the contract. These organizations are assigned resources based on the contracts need from pools or higher level functional organizations. Once assigned they become organic to that program organization and lose much of their functional identity.

I6 Interpretation:

Intent OK as written, but should mention IPDT concept.

I7 Interpretation:

Where matrix support, Integrated Product Teams, Work Teams and so on apply, the organizational breakdown structure must clearly identify the reporting relationships. Where subcontracted effort exists, the OBS must identify both the subcontractor and the internal personnel responsible for the management of that supplier.

CHECKLIST QUESTIONS:

- a. Are all authorized tasks assigned to identified organizational elements?
(This must occur at the cost account level as a minimum.)

IntGd Text

Good management mandates the establishment of clear effort/task responsibility within an organization. Since the definition process of the CWBS establishes a common framework for cost, schedule, and technical performance measurement and for the communication of results of the management process, a clear and definite assignment of organizational responsibility for the defined work establishes a single-point manager who can be held accountable for that work accomplishment. This is especially important at the cost account level. The cost account is the focal point of control within C/SCSC. Therefore, the cost account manager is the single point-of-focus for performance measurement. Here, more than anywhere else in the OBS, clear responsibility must be assigned, authorized, and encouraged. When clear responsibility is not established, unsatisfactory performance is less likely to be corrected; everyone feels that "it is not my responsibility, its someone else's." Decisive, effective management particularly corrective action, results from clear (and formal) assignment of responsibility.

G1 Interpretation:

It is necessary to clearly define who is responsible for what work to be performed. This establishes accountability.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation:

Again this interpretation is dated. Specifically the cost account may be a team with no specific cost account manager but accepting responsibility for the cost account's schedule, cost and technical requirements.

I6 Interpretation:

OK as written, but should mention IPDTs and IPDT leaders.

I7 Interpretation:

Where matrix organizations support the program, the inter-relationship between the support organization and the performing organization must be clearly identified. Where work teams or integrated product teams are used the relationship between the team leader and the cost account manager must be defined. I believe it is also appropriate to require clear definition of work package manager roles when they are used to support a Cost Account Manager.

- b. Is subcontracted work defined and identified to the appropriate subcontractor within the proper WBS element?

IntGd Text

Subcontracted effort must be clearly recognizable within the CWBS and the OBS. It is necessary to be able to identify each subcontractor's effort, and to be able to separate his performance from that of every other performer. This is often accomplished by creating separate CWBS elements for each of the subcontracted products/services and separate OBS elements for each of the major (or critical) subcontractors. (This is not a requisite of the criteria, however, but simply a method often successfully employed.) When subcontracted effort is not clearly separable it is difficult to determine the underlying cause of deviation from plans. This is true because performance data from the subcontractor would be combined with performance data from other elements (perhaps other subcontractors) so that is difficult to see who is responsible for what proportion of the data. It would be important to know, for example, if the entire cause of a deviation were attributable to a single subcontractor. Such information must be determinable by the reporting contractor as well as by the Government.

G1 Interpretation:

Clear definition of subcontractor work is necessary in order to properly analyze and measure performance of each subcontractor. It is important to keep subcontracted work separate from prime contract work or other subcontractor work in order to determine the cause for the variance from plan and who is responsible for the variance from plan.

G2 Interpretation:

Once again, the DID for the CWBS does not specify identity of subcontractors.

G3 Interpretation: O.K.

G6 Interpretation:

I have always required separate CWBS elements for major/critical subcontractor. Disregard the statement that "...this is not a requisite of the criteria...".

I4 Interpretation: O.K.

I6 Interpretation:

Creating separate CWBS elements for each of the subcontracted products/services could make an unnecessarily complex CWBS. Most validated contractors can identify subcontract effort without separate CWBS elements for each Subcontractor.

I7 Interpretation:

I agree that CWBS elements should identify elements where subcontracted effort will take place. I disagree with identifying the subcontractors in the contractual levels of the CWBS. Since a prime contractor is responsible for the integration of subcontractor data into the C/SCS reports, I see no value added in supplier identity in the CWBS and doing so might limit a prime contractor from taking corrective (termination) action when a subcontractor fails to perform.

3. PROVIDE FOR THE INTEGRATION OF THE CONTRACTOR'S PLANNING, SCHEDULING, BUDGETING, WORK AUTHORIZATION, AND COST ACCUMULATION SYSTEMS WITH EACH OTHER, THE CWBS AND THE ORGANIZATION STRUCTURE. (Reference format 1.)

IntGd Text

The basic necessity for the integration of the contractor's management subsystems listed above in an obvious one, but one which cannot be overlooked because of its obvious nature. It is imperative that, at any time, a contractor be able to provide a complete audit trail for any increment of work through the various management subsystems. He must be able to take you from the work task to the CWBS where the work is formally identified and defined. He must be able to trace the work task manager to the OBS where the chain of command is assigned. He must be able to trace the work task to the formal scheduling system so one can identify when, in time, this effort fits into the total contract plan. The contractor must be able to provide and explain the detailed plans for getting the work task accomplished, along with providing a definition of type of effort required. He should be able to break the effort down by element of resource (labor, material, etc.) and substantiate that efforts' budget construction. He should be able to show how the work plan is translated into action in the work authorization system and how actual accumulation of costs are tallied as that work is accomplished. Through this type of audit trail an alpha-numeric work designation system pervades; it is by this system that data is collected and flowed through the various levels of the CWBS and the OBS to the point of summarization and reporting. The existence of a faulty data collection system weakens not only management control of the contractual effort but also provides the opportunity for the management subsystems to be less than fully integrated. Where this occurs, cost, schedule, and technical parameters are most likely to be overrun.

G1 Interpretation:

The CPR system through the C/SCSC must be consistent with and relatable to each of the contractor's management control systems ... scheduling, accounting, contracting, etc. The integration should occur at the lowest controllable level, which is the cost account level and should flow through to the total contract level.

G2 Interpretation:

This interpretation could be expanded. The key is basically what type of audit trail alpha-numerical work designation is used to identify a work package task to cost account and allow for cost accounts to be summarized by WBS, OBS, and now by Integrated Product Teams. What allows the scheduling system, performance measurement system and the actual cost collection system to relate to each other at different levels of the WBS. It has to be done more than at just total contract and cost account level.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I3 Interpretation:

The various systems used by contractors are often independent from each other, often requiring the use of yet another system for integration. Other contractors have fully integrated systems that literally integrate all information at the lowest level of data collection. Others still have no electronic means of integration. The variety of systems, often unique to a single contractor, makes it necessary to perform crosswalks from one system to another. This is usually done at the cost account or the work package level and then at each level above that. JIG format 1 has been designed to help the review team accomplish that crosswalk.

Cost accounts are identified through the use of a responsibility assignment matrix (RAM), which is formed by crossing the CWBS with the OBS. The cost account is generally determined when a single element in the CWBS is identified in sufficient detail to be assigned to a single OBS element at the lowest level of management control. The Joint Implementation Guide (JIG) has an illustration of a RAM, but be cautious; it is rarely as simple as it sounds. The levels of Cost Account designations are frequently points of controversy, but once determined they should be clearly identified on the CWBS. There is no pre-set level for cost account identification; it should be a natural occurrence in the RAM. In addition to identification of cost accounts, there should be a description of the work content of the cost account. Such a description may be found in the CWBS dictionary, but this is not a requirement; it may be found in a number of other forms, such as a cost account plan.

I4 Interpretation: O.K.

I6 Interpretation:

Your interpretation should include mention of IPDT structures. It is possible that a contractor may not have a traditional OBS if organized into product teams.

I7 Interpretation:

I believe this topic should be expanded to include technical performance measurement systems as well as horizontal and vertical integration of the data.

CHECKLIST QUESTIONS:

a. Are the contractor's management control systems listed above integrated with each other, the CWBS, and the organizational structure at the following levels: (Use matrix to illustrate the relations.)

IntGd Text

A contractor's existing planning, scheduling, budgeting, work authorization, and cost accumulation systems must be integrated in such a way that data derived from one system is relatable and consistent with the data of each of the other systems. This must be done at least at the total contract level and the cost account level. Specifically, integration at the total contract level ensures that the contract goals are compatible. The Contract Budget Base, as a budgetary goal, must be compatible with the Master Program Schedule; these must be compatible with the capability of the accounting system to accumulate costs exclusively of other contractual efforts; and these must be compatible with the contractor's organizational management capability and the contracts technical specification goals outlined in the Statement of Work and defined by the CWBS. At the cost account level total integration is absolutely essential also. This is the level where actual work task management occurs and where performance measurement is conducted. At this level the scope of work is most specifically defined planned and scheduled to meet higher-level goals/milestones, and the cost account budgets are constructed and laid into a time-phased baseline for performance/progress measurement purposes. And at this level work is translated into action via work authorizations, work tasks are managed/supervised to completion, and actual costs are accumulated. Results of cost account management are reflected in data, all of which is initiated by the action of the cost account manager. This data simultaneously flows through each of the management systems, the CWBS, and the OBS to the reporting level and the total contract level, where program management can occur.

(1) Total contract?

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

Integration must take place as a minimum at the total program level and the data must be traceable from CAP to contract in both horizontal and vertical traces. Information derived from any of the above management systems must be consistent and reconcilable with data from all

other systems related to the same tasks.

(2) Cost account?

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

Since a Cost Account represents the point where work is managed, it should be the focus of all other management systems. Floor level and work in process systems should provide the necessary management information for the Cost Account Manager to effectively control the activity assigned to the CAP.

4. IDENTIFY THE MANAGERIAL POSITIONS RESPONSIBLE FOR CONTROLLING OVERHEAD (INDIRECT COSTS).

IntGd Text

Indirect costs must be managed and controlled in much the same way as direct costs. However, where direct cost managers have as their main goal effective cost control for the objectives of only a single contract, overhead cost managers must establish goals based upon the contractor's total business base (i.e. all the contracts that comprise his business volume). The way in which contractor attempt to control and manage the indirect cost effort may vary tremendously from one contractor to another. One may prefer a segregated control system where different managers provide checks and balances over one another with regard to indirect costs; other contractors may have unified or centralized overhead control systems. The method of overhead control often reflects, more than any other management system, the management philosophy of the contractor's chief executive. Because of the diversity between overhead control philosophy, and because of the large portion of total contract costs which are indirectly incurred, and because of the difficulty in measuring overhead performance, it is extremely important to examine the contractor's overhead management system and their control procedures. The first step in this examination is to identify which managerial positions the contractor has identified to control indirect costs. Secondly, it is important to ascertain the extent of responsibility afforded each of these managers.

Regardless of whether overhead control is centralized or segmented, a clear assignment of responsibility is paramount. Where responsibility is vague two syndromes tend to operate. First is the "It's not my responsibility" syndrome where everyone passes the buck in authorizing indirect services and everyone points the finger at someone else when it comes to justifying why an indirect service was authorized. The other syndrome is the "routing" syndrome where every request for indirect authorization and justification is kicked higher up in the chain of command because no one knows who has authority

and no one really wants the final authority for fear that they may later be held accountable for the decision. In many cases, one syndrome feeds the other and the two remain in constant fluctuating operation.

G1 Interpretation:

The contractor should identify personnel who are responsible for monitoring and controlling indirect costs. These costs should be analyzed, planned, budgeted, and controlled. The individuals identified must also have the authority to correct any indirect costs problems.

G2 Interpretation:

What's often missing in this discussion of overhead is the various roles of specific management personnel and at what level of the contract is overhead applied. Are labor hours burdened or unburdened at the cost account level. Does a CPR have burdened hours at each reporting level or unburdened hours and does the CPR include a one line add for overhead or a one line non-add. Based on the above, what is a CAM or Functional Manager responsible for as it relates to overhead in the areas of budgeting, analysis, controlling or Estimates At Completion (EACs). The question of who really does analysis of the overhead line on the Cost Performance Report is often overlooked and not done at all. Discussion should be more specific so as to explain roles of the CEO, Plant Manager, Controller, Program Manager, Functional Managers, Indirect pool managers, Cost Account Managers and now -- Integrated Product Team Managers.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I3 Interpretation:

Generally speaking, overhead includes indirect costs and General & Administrative (G&A) costs. Some people will debate similarities and differences, but as far as the C/SCSC is concerned, they are all treated the same, regardless of what they are called. This category of costs is comprised of all costs not directly charged to a contract. Such costs are charged to "pools" which are then allocated to the contracts through some standard algorithm that ensures that each contract gets a fair and equitable share, no more, no less. Each pool is managed by an individual which has the responsibility for controlling overhead costs within the pool. To determine compliance with this criterion, it is essential to understand the pool structure, its association with the OBS, and the logic of allocation.

The contractor has a Cost Accounting Standards (CAS) Board Disclosure Statement that, among other things, will state the company's policy regarding direct vs. indirect costs. The contractor will also negotiate Forward Pricing Rates which help to establish the overhead rates and how they relate to direct costs for planning purposes. The Review Director and the Team Chief should enlist the help of the local CAO and DCAA representatives while reviewing this area of the contractor's systems.

I4 Interpretation:

Current interpretation is fairly good. The only comment that I would make is that overhead controls are not generally task directed as are direct labor controls. Overhead tends to be LOE in nature.

I6 Interpretation: O.K.

I7 Interpretation:

This should be part of the Organizational Breakdown Structure (OBS) requirement. Since it is called out separately, it must demand that managerial responsibility be defined and responsibility to provide input to the Cost Performance Report when variances result from indirect costs must be clearly identified.

CHECKLIST QUESTIONS:

- a. Are the following organizational elements and managers clearly identified:
 - (1) Those responsible for the establishment of budgets and assignment of resources for overhead performance?

IntGd Text

Among the controls necessary to manage overhead costs is the establishment of responsibility for control of such costs. This includes first, a clear definition of who is responsible for establishment of overhead budgets. Normally this is a centrally controlled function because overhead goals establish the overhead rates that will eventually be applied to the direct costs. Overhead Budgeting responsibilities must be clearly stated as must the overhead budgeting process and who this responsibility rests with.

In addition to budgeting responsibility, assignment and control of the overhead resources is also a responsibility that must be clearly defined. This responsibility is often assigned to the managers who are most directly responsible for supplying these indirect services. Such authorization responsibility is often placed separately at each overhead pool or category.

It is sometimes the case, that a contractor will centralize these two areas of responsibility. Other contractors make each responsibility an iterative process involving a series of several managers. This criteria does not attempt to imply how overhead budgeting and resource assignment should be managed. It merely insists that to be effective, these managers so assigned should be specifically identified and warranted with specifically defined limits of authority.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

- (2) Those responsible for overhead performance control of related costs?

IntGd Text

Responsibility must also be clearly established for overhead performance (both cost and schedule performance) and control. These responsibilities must be established for each overhead pool or category and must be assigned to individual managers. Normally such managers are those whose organizational assignment is most directly related to the consumption of the resources contained in that overhead category. Again, this criteria does not imply who these managers must be or at what level in the organization structure these managers must function. But it is paramount that someone be assigned the specific responsibility of measuring overhead performance and exerting control over variances that occur in the indirect cost areas.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation:

Current interpretation is good There is concern with the discussion on schedule. Generally overhead is by its nature LOE with the result that there is no specific schedule to follow.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

- b. Are the responsibilities and authorities of each of the above organizational elements or managers clearly defined?

IntGd Text

In addition to clearly identifying who has what type of responsibility with regard to indirect cost control, it is necessary to define the tools available to these assigned managers. This includes a clear, formal statement of each overhead manager's authority and the extent of his responsibility within the company's overhead control system. To be effective in the control of overhead resources, for example, a manager must have the authority to either approve or avoid the expenditure of resources and he must have the responsibility for justification when the expenditure of indirect resources is incurred. The limits of each overhead manager's authority should be stated as specifically as possible. Only in this way will these managers feel free to exert the control with which they are endowed.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

Who will provide the variance analysis for indirect cost related VARs? Where indirect costs cause a Cost Account or Program to go into a VAR condition, the manager who has the responsibility for managing those indirect costs must be tasked with providing an appropriate analysis of the causes, impacts and actions to mitigate the problem.

5. PROVIDE FOR INTEGRATION OF THE CWBS WITH THE CONTRACTOR'S FUNCTIONAL ORGANIZATIONAL STRUCTURE IN A MANNER THAT PERMITS COST AND SCHEDULE PERFORMANCE MEASUREMENT FOR CWBS AND ORGANIZATIONAL ELEMENTS.
(Provide matrix showing integration.)

IntGd Text

The first two Organization criteria required the contractor to define/organize the contract scope of work and to identify/or organize his managerial staff in a manner that can get contract work accomplished. This criteria requirement juxtaposes these first two criteria; it requires their integration in a manner that enhances performance measurement. The cost account has been previously identified as the lowest-level focal point for management control of all contractual effort. It is the initiation point for performance management and measurement. Hence, this criteria is requiring that the CWBS should be integrated with the OBS at least to the extent the Cost Account Managers be assigned to their respective cost accounts for purposes of performance measurement.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I3 Interpretation:

If the first four criteria have been met, then all that's left to satisfy this one is to develop a matrix to demonstrate the capability. This is nothing more than demonstration that the RAM is truly constructed with the OBS and the CWBS, that performance measurement is occurring at the cost account level, and that the elements of performance measurement can be accumulated upward through the OBS and the CWBS. This is nothing more than an extension of criterion 3.

The elements of performance measurement, BCWS, BCWP, ACWP, BAC, EAC, and the schedule milestones associated with the work, all combine at the cost account level in a way that allows the cost account manager to measure performance to date and predict future performance. Compliance with criteria 1 and 2 determine that the structures exist for organizational roll-up and for product (WBS) roll-up; this criterion is intended to determine if systems and/or procedures are in place that provide the capability for roll-up and the use of such information at the levels above the cost account level. Structure, capability, and use are at the root of the Organization section of the C/SCSC, which in turn sets the scene for the remainder of the criteria.

I4 Interpretation: O.K.

I6 Interpretation:

Supplemental Guidance #06 replaced "ORGANIZATIONAL ELEMENTS" in question 5, above, with "RESPONSIBLE ELEMENTS". Also, what about addressing IPDTs? The contractor may not have traditional functional elements if organized by product team.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

- a. Is each cost account assigned to a single organizational element directly responsible for the work and identifiable to a single element of the CWBS?

IntGd Text

Each cost account must be assigned to a single contractor organizational entity that will be primarily responsible for the accomplishment of that work. Making someone singularly responsible for accomplishment of a specific portion of work within a budget and schedule constraint is mandatory to this progress evaluation system we call "performance measurement." In addition, this allows a clear summarization of cost, schedule, and technical performance data up through the OBS without allocation of data from one lower department to two or more high organizational elements. And since each cost account is a logical subdivision of a higher level CWBS element, it must be identifiable to only one CWBS element. This ensures that cost, schedule, and technical performance data can also be summarized directly through the CWBS without subdivision or dual allocation.

Many Contractors construct a chart called a Responsibility Assignment Matrix (RAM) with the cost account managers listed on one axis and the CWBS cost accounts listed on the other axis. This RAM then, becomes a cross check to ensure singular OBS responsibility of each cost account manager for each CWBS cost account element. This one-to-one alignment is absolutely essential to ensure complete work coverage and reliable data reporting.

G1 Interpretation:

Every cost account must have one organization responsible for its completion. Single responsibility instills accountability.

G2 Interpretation:

This criteria needs to be reviewed from the aspect of Integrated Product Teams. Is an integrated product team a WBS entity such as for wheels regardless of functional identity of team members or is the integrated product team limited to the functional discipline only such as engineering. I think we now need a RAM showing the integration of product teams to a WBS element.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation:

Current interpretation is dated. Again a cost account might be a team which has no specific cost account manager. The term would be self directed work team. The interpretation needs to be updated to broaden the concept to allow advanced management concepts into the defense industry. Matrix organization is only one method of management.

I6 Interpretation:

The cost account may be assigned to an IPDT leader, and work packages may be assigned to several organizations if cross-functional teaming is being used.

I7 Interpretation:

This does not limit the use of work package managers and performing departments to accomplish the work within a Cost Account. The CAP is established for management control and visibility at a level where performance measurement is most appropriate. Often times the CAP resides at a level in the Organizational Breakdown which is above the performing departments or managers who simply perform tasks related to the CAP but do not have the ability to realign resources, authorize over-time or purchased labor, and so on . When work package managers or performing departments are used to accomplish the activities within a CAP, the CAP is still the responsibility of a single manager, the CAM.

Where it makes sense from a management perspective, a summary level CAP may be used for tasks related to more than one WBS element. Where used, a summary level CAP must allow visibility into the impacts on specific WBS elements. Examples of Summary level CAPs are: Fabrication where parts are manufactured across many WBS elements in a process where it makes more sense to manage the process than the piece part. General Material where miscellaneous parts and supplies are purchased which are common to several WBS elements and acquired by use of a single purchasing document.

b. Are the following elements for measuring performance available at the levels selected for control and analysis:

IntGd Text

By definition, a cost account is the lowest level of full management responsibility. Therefore, the "level" selected for control and analysis must be the cost account. BCWS, BCWP, and ACWP as a minimum, therefore, must be generated for the cost account. Attendant to these data elements, Budget at Completion (BAC), Estimate at Completion (EAC), Cost Variance (CV), and Schedule Variance (SV) can also be derived at the Cost account level. This cost-account-generated data must be capable of being summarized to any higher level of the CWBS and OBS as necessary for timely analysis and control of the total contract. Cost Account selection must be governed by some degree, then, by the ability to develop and collect these data elements. When cost accounts are not properly selected, it is possible that the contractor's management control system will not be capable of providing valid data in a timely manner.

G2 Interpretation:

This checklist item addresses the cost account as the lowest level of management responsibility. I suggest that if a company can't find a way to charge actual costs at work package level, that company is going to have a difficult time of establishing Integrated Product Teams which in the future should be the level of full management responsibility rather than the cost account level.

I6 Interpretation:

OK as written, but should perhaps mention IPDTs along with the CWBS and OBS.

(1) Budgeted Cost of Work Scheduled (BCWS)?

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation:

Current interpretation is marginal. There is clear discussion in the criteria that states the work package level is the point of budgeting. Not the cost account level.

I7 Interpretation: O.K.

(2) Budgeted Cost of Work Performance (BCWP)?

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation:

Current interpretation is marginal. There is clear discussion in the criteria that states the work package level is the point of budgeting and therefore BCWP measurement. Not the cost account level.

I7 Interpretation: O.K.

(3) Actual Cost of Work Performed (ACWP)?

G1 Interpretation:

The lowest control point (the cost account) should have reportable BCWS, BCWP, and ACWP. All elements for measuring performance must be reportable from the same WBS reporting level. The cost account must be able to roll-up to higher levels of reporting to the total contract level.

G3 Interpretation: O.K.

G6 Interpretation: O.K.

I4 Interpretation:

Current interpretation is marginal. There is clear discussion in the criteria that states the cost account level may be the level of the point of actual accumulation.

I7 Interpretation:

I agree with the write-up but feel that it might be appropriate to add: For internal management purposes and when desired by the CAM, ACWP may be collected below the CAP level. When ACWP is collected below the CAP level, Estimate at Complete documentation and analysis for performance measurement purposes will be done at the CAP level.

II. PLANNING AND BUDGETING

Note: Respondent G6 concurred with all of the current *Interpretive Guide* descriptions except for criterion 5, checklist item e, and criterion 7, checklist item b.

1. SCHEDULE THE AUTHORIZED WORK IN A MANNER WHICH DESCRIBES THE SEQUENCE OF WORK AND IDENTIFIES THE SIGNIFICANT TASK INTER-DEPENDENCIES REQUIRED TO MEET THE DEVELOPMENT, PRODUCTION, AND DELIVERY REQUIREMENTS OF THE CONTRACT.

IntGd.Text

This criteria is the only one which deals specifically with the need to schedule work. It does not require the contractor to use any specific type of scheduling technique, however, PERT/Critical Path, Line-of Balance, Gantt, and Milestone charting are all effective scheduling techniques; and any one or combination of these (or others) may be employed. Primarily what this criteria requires is that a formal (*via* written system description and internal operating procedures) scheduling system be established and used consistently to ensure discipline in the sequencing of work throughout the life of the contract. Secondly, this criteria requires that these procedures be followed as a means of documenting, in writing, the complete schedule plan of work. These schedules should consist of summary or master schedules and related subordinate schedules which provide a logical sequence from the summary to the detailed work package levels. In so doing, the schedules can provide for the interdependent sequencing of all work authorized on the contract in a manner compatible with the contract milestones and the technical requirements of the contract. The end goal of such schedules is that they provide a vehicle for evaluating actual progress (in time) against established milestones of achievement.

G2 Interpretation:

It is suggested that most system descriptions are now general in nature as to what scheduling systems must do in relation to the criteria. Contractors may choose to use different scheduling systems on different contracts. Therefore, contractors must establish Operating Procedures or Operating Instructions which fully describe the scheduling systems used for a specific contract. The discussion should address who and how scheduling systems are established, statused, and forecast. They must also trace vertically and horizontally through use of successor and predecessor identification.

***G3 Interpretation:* O.K.**

***I6 Interpretation:* O.K.**

***I7 Interpretation:* O.K.**

CHECKLIST QUESTIONS:

a. Does the scheduling system contain: (Prepare exhibit showing traceability from contract task level to work package schedules.)

G2 Interpretation:

This could be enhanced to be more specific as to prime contractor schedules must show the work being performed by major subcontractors as to schedules, status, and forecast.

(1) A master program schedule?

IntGd Text

Of prime importance, and basic to all scheduling systems, is the identification of the goals of the contract to a time interval for accomplishment. This entails identification of contract milestones to calendar dates for important contract development and production decisions. Prototype testing, subcontract and/or government-furnished material delivery dates, and end item delivery requirements of the customer are examples of a few. These milestones, or goals, called out on the contractual document itself, must be laid into the Master Schedule first. These will become the primary measurement points for determining contract progress by both the contractor and the government. But at the onset, they provide the most basic planning goals for the contractor. It is toward these goals that he will plan all the work tasks, integrate the work force for this contract with the work force requirements of his other contracts, and plan his material procurement need-dates to integrate with his inventory management capability. These scheduling goals will directly impact his cash-flow requirements and to this end many contractors establish additional program milestones in their master schedules to ensure cash/payroll availability. Once finalized, the Master Schedule's milestones become major goals for underlying, subordinate organizations toward which they can plan their work schedules.

G3 Interpretation: O.K.

I6 Interpretation: O.K..

I7 Interpretation:

I agree with the write-up. It is also appropriate to have the master program schedule identify the non-contractual key events which occur along the path to completion such as PDR, CDR and the like.

(2) Intermediate schedules, as required, which provide a logical sequence from the master schedule to the cost account level?

IntGd Text

Intermediate schedules may be of two different orientations. They may be functionally derived (i.e., by the functional departments that comprise the contractor's organization such as Quality Assurance, Engineering, Manufacturing, etc.) or they may be related to WBS elements as a means of scheduling/identifying the interrelationships that exist between the various hardware components. Intermediate schedules, however, are not required by the Criteria. Some contractors may translate the Master Schedule goals directly to the lower-level Cost Account Schedules. But where contractors do utilize

intermediate schedules, regardless of their orientation, these intermediate schedules must perform a "linking-pin" function to tie the detailed schedules at the cost account level into the total contract, master schedule; they thus provide complete schedule traceability for all authorized work.

G3 Interpretation: O.K.

I6 Interpretation:

The interpretation should be amended to address more than two orientations (functional and WBS) -- another orientation might be related to IPDTs, if used.

I7 Interpretation:

I agree with the write-up. Added to the write up should be verbiage related to Integrated Product Team and Work Team schedules as appropriate intermediate levels. This should require integration of Team schedules with program, functional and detailed schedules.

(3) Detailed schedules which support cost account and work packages start and completion dates/events?

IntGd Text

Because cost accounts have a defined and authorized scope of work, translated as they are from the CWBS and the OBS, they have limited life. That is, they have a predetermined start-date and completion-date. Such dates must be derived from, and be within, the boundaries established by higher level controlling schedules (Intermediate and Contract Master Schedules). This provides the means to control the application of resources in accordance with the Master plan/schedule. An important aspect of schedule date flow-down to the cost account level is the clear definition of what constitutes completion of the effort within a cost account (the tangible evidence, in other words); this event must be discretely defined and must be tied to a scheduled date. And although less rigidly enforced in practice, what constitutes the "start-of-work" is considered just as important. Tying this evidence for start-of-work to a scheduled date, along with that for work completion is what ensures compatibility with other "dependent" schedule events.

G2 Interpretation:

Suggest this discussion be enhanced to address that if a cost account plan is considered to be a detailed schedule, this plan must show status and forecast. It should not display only a time now line position. In addition, this schedule must also show interdependencies.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up. Horizontal integration of detailed schedules insures that cost accounts are planned with recognition that events may constrain or be constrained by events in other cost accounts, organizations or teams.

b. Are significant decision points, constraints, and interfaces identified as key milestones?

IntGd Text

This subquestion to the scheduling criteria is intended to help define what constitutes a "key" milestone. On a Master Schedule, it was previously stated, the "key" milestones should be included, (examples were: the major development and production decisions (such as DSARC-1, DSARC-2, etc.) prototype testing, subcontracted or government-furnished equipment delivery dates, end-item delivery dates.) The use of such "key" milestones ensures that the planning and budgeting activities of the various functional organizations use identical points of reference for task planning and performance measurement schedules. Without this consistency, performance measurement is distorted. For example, "key" milestones established by a Master Schedule should be incorporated into the applicable intermediate schedules and down through the detailed schedules within the cost accounts. Such "key" milestone identification also facilitates interfunction communication by defining future activities which may be impacted by current activity delays. Of prime importance here then, is that the contractor have an intent-statement in his Scheduling System Description to identify all contract "key" milestones in his Master Schedule. It then becomes incumbent upon any system reviewer to ensure than no contract "key" milestones have been overlooked, ignored, or otherwise omitted.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up except that it seems to infer a separate formal scheduling system description where none is required by the criteria. I believe we should be stressing a single description to manage all aspects of the work, cost, schedule and technical.

Would it be appropriate to require that key milestones be reflected in all lower tier schedules, down to and including the Cost Account? Key milestones may exist at levels below the program master schedule which impact activities below them but which may not be appropriate to display on the top tier schedules. In any event, rarely, if ever, should a higher level schedule contain more detail than the sum of all the schedules below it.

c. Does the scheduling system provide for the identification of work progress against technical and other milestones, and also provide for forecasts of completion dates of scheduled work?

IntGd Text

This subquestion is often confusing to system review personnel because of its apparent overlap with other subquestions which occur later in the planning and budgeting criteria. It does not ask if the contractor is, in fact, measuring work progress against milestones. Rather it asks if the contractor, in his Scheduling Systems Descriptions and

internal operating procedures, requires that his schedules (master, intermediate and detailed) be constructed for this eventual purpose. The system reviewer must ensure that the Scheduling System Descriptions voice this intent and then he must check the constructed schedules to ensure that they have in fact, included in them technical and other milestones (goals or other concrete evidence of work task completion) which can be used later on to measure how much work has been accomplished at any point in time. Given this capacity for accurate work statusing, the realism for forecasting work completion dates is enhanced. So the Scheduling System Description must also include the intent for the performing organization to forecast completion dates for work which has departed from the original plan. This is to ensure that projected schedule slippages are surfaced for management action in a timely manner.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up except that it seems to infer a separate formal scheduling system description where none is required by the criteria. I believe we should be stressing a single description to manage all aspects of the work, cost, schedule and technical.

- d. Are work packages formally scheduled in terms of physical accomplishment by month, week, or day as appropriate?

IntGd Text

During initial detail planning of the work, dates for work-start, completion any intermediate status-measurement milestones are formally documented and recorded. This establishes the basic (detailed) work-schedule plan against which performance will ultimately be measured. However, various contractor organization may establish such dates by different frames of reference. Procurement and Subcontract Administration department often establish such dates with reference to a Julian calendar because of the ease it provided in calculating lead times for delivery need dates. Program Management personnel may status their work by the standard Gregorian calendar since this is the schedule frame-of reference used in the contractual documents.

Manufacturing and Quality Assurance personnel often schedule by manufacturing days since they often do assembly-line work and could generally care less as to which contract each manufactured item is going to. Cost accountants on the other hand often work by fiscal-year calendars of one type or another. The point is, all work authorized for accomplishment on a contract, regardless of which organization is responsible for accomplishing it, must be scheduled to a specific day for starting, completion, and intermediate milestone assessment. Where different organizations use different types of calendars, their schedules must be integrated to the cost account, intermediate, and master schedule terminology to ensure unity of purpose and unity and communication.

G2 Interpretation:

O.K. However, the discussion does not recognize that most schedules involving manufacturing

are by manufacturing day and not calendar or Julian day. What is a manufacturing day?

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

How does the requirement for start, stop and internal milestone dates occur in those authorized activities which are level of effort. Level of effort activity generally occurs over long periods of time (often the life of the contract) and except for identifying general spans within which LOE occurs, it is not possible to discretely plan. (If it were, the tasks would not be level of effort.)

2. IDENTIFY PHYSICAL PRODUCTS, MILESTONES, TECHNICAL PERFORMANCE GOALS, OR OTHER INDICATORS THAT WILL BE USED TO MEASURE OUTPUT.

IntGd Text

There is considerable dependence between Planning and Budgeting Criteria Number one and two. Number one requires sequential scheduling that will identify task interdependencies. Number two requires identification of interim goals by which to measure work accomplishment. Once the schedule is established the contractor should devise a methodology for tracking his actual accomplishment of that scheduled work. To avoid subjective guessing of work accomplishment, identification of milestones within the schedule will make it possible to place an objective value on the amount of work required to meet that milestone goal, and in addition, as work can be proven to have been accomplished, the contractor can proceed on to the next task in the scheduled sequence. These two criteria, therefore, from a practical sense, should be accomplished simultaneously and the conscientious planner (and systems reviewer) should ensure that these interim goals have been identified within all work schedules.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up but feel that it should address level of effort. LOE must be kept to a minimum to preclude distortion of the actual performance for the contract.

CHECKLIST QUESTIONS:

- a. Are meaningful indicators identified for use in measuring the status of cost and schedule performance?

IntGd Text

A previous Scheduling Criteria subquestion asked in the contractor's Scheduling System Description required that milestones be identified for use in measuring performance. This subquestion goes one step further; it asks if these milestones are meaningful. It's a quality assurance-type question: Has the contractor identified meaningful indicators for work assessment? Some management control systems measures progress on the basis of input-oriented indicators. Time and money expended are two such indicators. These are not considered meaningful indicators, however, because regardless of the amount of time or money expended the effort may still not be accomplished. Despite this, many firms still measure their percent complete as the amount of actual resources they have expended (ACWP), divided by the amount of resources they planned to expend (BCWS). This calculation can only be as accurate as the validity of the originally planned resources or resource estimate at completion. Meaningful indicators are those which address physical or tangible completion. "Actual units installed," "system or subsystem tasks completed," "drawings signed-off" are some examples of tangible indicators. Even seemingly physically-oriented indicators like "units installed" can be elusive, however, depending on what constitutes completion of an installation. Drawings can be "signed off" with holds, and more or less than the planned quantities may be required to complete an activity. Therefore, care must be exercised in selection, identification, and definition (particularly definition) of such indicators. The contractor must minimize the need for subjective guesses in determining actual accomplishment.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up except that it seems to infer a separate formal scheduling system description where none is required by the criteria. I believe we should be stressing a single description to manage all aspects of the work, cost, schedule and technical.

The previous criterion sub-question does not require that milestones and only milestones be identified for use in performance measurement. It asks if the system provides for the identification of work progress against technical and other milestones (II.1.c.) and whether work packages are formally scheduled in terms of accomplishment ... as appropriate (II.1.d.). This question stresses "indicators" which might be equivalent units, drawing release status, etc. not necessarily milestones and surely not necessarily milestones within a CAP or work package.

- b. Does the contractor's system identify work accomplishment against the schedule plan? (Provide representative samples.)

IntGd Text

Under the first Planning and Budgeting Criteria a subquestion asked if the contractor's scheduling system identified work accomplishment against technical and other milestones. This subquestion, however, asks if the contractor's system identifies progress against the schedule plan. Overlap of these two subquestions is obvious since our previous schedule criteria required that the contractor's schedule plan be composed of

meaningful milestones. It would appear that progress measurements based on milestone accomplishment would be sufficiently measuring progress against the schedule plan as well. But while this may be true in some cases, it can not be assumed to always be true. At the detailed work level (cost account level) progress measurements must be made based upon milestone accomplishment. A cost account manager may report that he has accomplished 30% more milestones than scheduled in a particular month. On the surface we could assume that he is, therefore, 30% ahead of schedule. Upon closer scrutiny, however, we might find that some of the accomplished milestones were rework milestones based upon work that should have been finished in an earlier period of time. In addition, some of the milestones might have been accomplished out-of-sequence because they were easier to do than the in-sequence ones. And still other of these accomplished milestones may be the result of a work-around procedure not in the schedule plan, but necessary because one of the scheduled milestones could not be achieved. The point is, assurance of progress measurements against specific milestones is important, but one must go one step further and evaluate what these milestone accomplishments mean with reference to the overall schedule plan.

G2 Interpretation:

I believe that the key question for this criteria is "does the contractor's system identify work accomplishment against the scheduled plan." Some people tend to believe that the performance measurement value BCWP, and the scheduling system values are exact. They should be related however not necessarily the same. For example, a scheduling system would show a milestone as maybe a blackened end bar that related a percent of progress to the next milestone. The performance measurement system earned value technique may not allow earned value (BCWP) to be taken until the milestone is done.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

While I recognize milestones are the desired measurement for accomplishment, there are many methods of assessing performance against a plan. Therefore the interpretation should require the team to evaluate how the contractor measures accomplishment and reflects that performance in the schedules used for the program.

- c. Are current work performance indicators and goals relatable to original goals as modified by contractual changes, replanning, and reprogramming actions? (Provide exhibit showing incorporation of changes to original indicators and goals.)

IntGd Text

Primarily this subquestion is to ensure traceability of contract performance in the dynamic environment of contract changes so that the performance measurement baseline (PMB) is consistent and changes to it are readily traceable. Ensurance of such traceability is accomplished by comparison of those work performance indicators and goals, key milestones in other words, of the original contract to those of the current contractual document. Where direct comparison is not possible, we expect the contractor

to be able to provide a "trace" of how his schedule plan evolved from the original contract goals to the current contract goals. To the extent this is accomplished the PMB is directly reconcilable as the plan to measure performance against.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up but it should stress that the PMB and the various tiers of the schedule must be maintained with strict baseline control. If the PMB is subjected to strict schedule control and the intermediate and detailed schedules are allowed to be re-baselined as events move along the critical path, management of the program becomes impossible and either the cost or schedule data must be discounted.

3. ESTABLISH AND MAINTAIN A TIME-PHASED BUDGET BASELINE AT THE COST ACCOUNT LEVEL AGAINST WHICH CONTRACT PERFORMANCE CAN BE MEASURED. INITIAL BUDGETS ESTABLISHED FOR THIS PURPOSE WILL BE BASED ON THE NEGOTIATED TARGET COST. ANY OTHER AMOUNT USED FOR PERFORMANCE MEASUREMENT PURPOSES MUST BE FORMALLY RECOGNIZED BY BOTH THE CONTRACTOR AND THE GOVERNMENT. (Reference formats 2 and 8.)

IntGd Text

After all the authorized work required on a contract has been organized and planned-out, after it has been assigned to functional managers for accomplishment, and after these functional managers have scheduled and budgeted this work, the actual work may finally begin. And as soon as work is begun, the contractor must start asking his functional managers how the work is progressing. Their responses, at best, can only be relative to some basis of measurement. The cost account manager must ask in response to how the work is progressing, "compared to what." If that vehicle for comparison is standardized among cost account managers the responses will not be relevant. This criteria serves as the requirement for cost account managers to establish a standard vehicle for comparison of work accomplishment. That vehicle is the Performance Measurement Baseline. It represents the formal plan of each cost account manager to do all the work assigned to him/her in the amount of time allotted and within the amount of budget authorized to accomplish that work. Given this standardized plan to use as a baseline, cost account managers can then respond that their performance is such-and-such with respect to that plan.

G2 Interpretation:

Functional Managers may or may not be involved. In some cases a Functional Manager is no more than a coordinator between the CAM and Program Manager. In other cases the Functional

Manager may not be involved at all. With IPTs, the time phased baseline may be between the Program Manager, the IPT and Cost Account Manager.

G3 Interpretation: O.K.

I6 Interpretation:

Although there has not been specific PMJEG Guidance on this particular question, it could be argued that your interpretation should reflect the PMJEG Organization Guidance to revise the references to functional managers to responsible managers. (See comments in the Organization Section.) This change would accommodate discussions of the role of the IPDT team leader. The balance of the interpretation is acceptable, as written.

I7 Interpretation:

I agree with the write-up but it should also include use of Integrated Product Teams and Work Teams.

CHECKLIST QUESTIONS:

a. Does the performance measurement baseline consist of the following:

(1) Time-phased cost account budgets?

IntGd Text

The foundation of a C/SCSC - validated performance measurement system is the cost account. As the lowest level where full management responsibility and control exists for a given CWBS element, the cost account must be the basic ingredient of the performance measurement baseline. Each Cost Account must be planned-out on a task-by-task basis. These tasks must be oriented into the proper sequence for accomplishment, and must be scheduled, or time-phased, across the calendar period allotted for the accomplishment of that cost account. This same scope of work must have a budgetary target established for it as a goal and each of the subordinate tasks planned and scheduled must be allocated a reasonable proportion of the total cost account target budget. Having broken down the Cost Account's scope of work into its subordinate tasks and having budgeted each of these tasks, it is then possible to see what budgetary goal is available to do each month's worth of work. This process is a simplistic model for establishing a time-phased budget plan which can later be used as a baseline against which the cost account's progress/ performance can be measured. The goal of this criteria subquestion is to ensure that each and every cost account have such a pre-determined PMB for performance measurement purposes. Collectively, these cost account PMBs will comprise the major portion of the total contract PMB.

G2 Interpretation:

At some companies, the work package becomes the lowest level because actuals are charged at work package level. This is even more true where IPTs are involved. BCWS and BCWP have to be at Work Package level but ACWP does not. Companies are changing their mainline systems more and more to accommodate actuals being charged at work package level. As stated

earlier, this is almost a must if the company is establishing IPTs and managing by completion of tasks.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

(2) Higher level CWBS element budgets (where not yet broken down into cost account budgets)?

IntGd Text

Recognition must be given to the cycle-time associated with the functional budget release and the subsequent approval of cost account budgets. This is especially true when far-term work definition is being accomplished. It is essential to establish a realistic PMB as quickly as possible, however many C/SCSC - complaint management control systems release budgets to major functional organizations at a summary CWBS level.

Subsequently these higher level organizations at a summary CWBS level. Subsequently these higher level organizations will breakdown and distribute their budgets to the lower cost account level. (The cycle time required to do this does not relieve the major functional managers from their responsibility to flow-down this summary level budget to the cost account level in a timely manner). Hence, these higher level budgets should be temporary accounts; they should not be used as a management reserve or a contingency fund. At any given point in time, then, the PMB of the total contract may be composed of not only the collective, time-phased, cost account budgets, but also any existing higher-level budgets as well.

G2 Interpretation:

Size of a contract can also slow down the distribution to cost account but the managers can place budget in the higher level CWBS elements. Many companies provide that they could do this but in practice don't because the accounting system must then provide another cost collection bucket account so that the sum of all designated cost accounts plus the bucket account equals the CWBS element budget.

G3 Interpretation: O.K.

I6 Interpretation:

Agree with interpretation, as written. This is another place where you might want to give consideration to changing functional to responsible. If IPDTs are being used, an IPDT team leader might have responsibility for budgets which have been released at a summary CWBS level.

I7 Interpretation: O.K.

(3) Undistributed budgets, if any?

IntGd Text

The criteria collectively require that the contractor, at all times, be able to account for all budgets allocated to a given contract. The contract PMB represents the contractor's plan for doing all the contractual work within the confines of this budget allocation. As has been previously mentioned, the bulk of this budget plan is composed of time-phased cost account budgets. The PMB also contains, as necessary, higher-level budget accounts. But in addition to these, one must recognize the occurrence of situations wherein contract changes are received by the contractor too late within the accounting period/month, to be distributed down to the cost account or even the summary levels. Where this occurs the contractor, as a means of accounting for all budget allocated officially to the contract, places this undistributed budget into a holding account. This holding of undistributed budget must be temporary. Within the contractor's system description should be written an intent-statement limiting the period of time in which budget may remain undistributed. (Budget should be distributed down to the cost account level as soon as possible, normally within the next accounting period/month -30 days). So at any point in time, if a contract change has been received in the recent past the contractor's PMB could be in part composed of Undistributed Budget.

G2 Interpretation:

Budget may also be retained in UB for authorized work which has not been negotiated but allocating budget only to that work which will start in the interim.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

(4) Indirect budgets, if not included in the above?

IntGd Text

Indirect budgets (overhead) are budgets for costs which, because of their incurrence for common or joint contractual objectives, are not readily subject to treatment as direct costs. Indirect budgets are authorized to specific functional managers within the contractor's organization who are assigned responsibility for controlling indirect costs. These overhead managers may exist at any level of the contractor's OBS; the criteria makes no specification in this regard. Technically, overhead managers could be at the cost account level or at any of the intermediate or higher summary levels of the contractor's organization. As PMBs are summarized from the cost account levels up through the summary levels to construct the total contract PMB, overhead budgets must be included at the level where the contractor has assigned responsibility for their application/incurrence. Hence, the total contract PMB is composed of not only the direct cost budgets for the contractual work but of the indirect budgets as well.

G2 Interpretation:

Emphasize that overhead can be applied at any level of the contract but must be considered as part of the PMB. Management Reserve is the only item which is outside the PMB.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

- b. Is the entire contract planned in time-phased cost accounts to the extent practicable?

IntGd Text

Advance planning is one of the key tenets of the Planning and Budgeting Criteria and is referred to by several of the subquestions. The ensured adequacy of advance planning both improves the work performance capability and ensures sufficient budget exists to provide reasonable performance objectives throughout the life of the contract. A further objective is to prevent very short-term incremental planning (such as the planning of a subsequent week's work at the end of the previous week.) Unless the contractual effort is sufficiently planned in advance cost account managers will be frustrated (and prevented for the most part) from adequately managing their portion of the CWBS work. They will not be able to identify all the tasks required, they will be unable to sequence the work correctly, they will be unable to schedule the work among other contract requirements and they will be prevented from establishing a reasonable budgetary target or performance measurement baseline. At the start of a contract, however, it is recognized that all of the work cannot be fully defined as to organization or CWBS elements with enough detail to develop all of the future cost accounts. At contract award, the first one or two years of work should be defined to the cost account level as soon as possible. As work proceeds, the remainder of the contract effort should be defined to the cost account level; usually by the end of the first year this can be reasonable accomplished. This is not to imply that these one and two year standards are (or should be) a norm. The sooner advance-planning occurs, generally the more benefit can be derived, however.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation:

Agree with the interpretation except for the statement that the first one or two years of work should be defined to the cost account level as soon as possible. I feel that the student may interpret this as an implied direction to insist upon one or two year norms. The PMJEG Supplemental Guidance #07, dated 5/13/91, added the following guidance: "On some development contracts, due to work scope and funding uncertainties, it may be impractical to identify future work beyond a significant contract phase or event (milestone) e.g. Preliminary Design Review or Critical Design Review. The interpretation would be clearer if specific time periods were not cited. It should suffice to say that the sooner advance-planning occurs, generally the more benefit can be derived.

I7 Interpretation:

I agree with the write-up but there should be an expansion of the discussion of where the budget is held pending roll-down to the cost account level. I believe that it should be held at the

program level to preclude inappropriate use as a functional management reserve. Since it is identified to gross levels of organization and work breakdown, this higher level could be held in summary level planning packages held by the program manager. This disadvantage of this is that future higher level schedule (beyond the budgeted cost accounts) may not have adequate lower level supporting data.

- c. In the event that future contract effort cannot be defined in sufficient detail to allow the establishment of cost accounts, is the remaining budget assigned to the lowest practicable CWBS level elements for subsequent distribution to cost accounts?

IntGd Text

In line with the previous criterion the objective here is to ensure that work is planned and budgets are allocated as far down into the organizational and CWBS elements as practical. Also desired here is that reasonable budgets be provided for performance measurement purposes throughout the life of the contract. A common failing of contract planners is to provide over-generous budgets for the initial work (because of the fear of unknown (risky) design, set-up, or material lead-time problems) and "lean" budgets later on in the schedule (because of an optimistic value placed on learning curves, and program maturity). Often this results in performance appearing superior in the earlier phases of the contract only to deteriorate rapidly when the lean-budgeted task are finally encountered. Instead of this practice, contract planners should be encouraged to break down the future work into the smallest increments which still contain budget, schedule, and scope of work. Only in this way can the reasonableness of these future budgets be ascertained. "Reasonableness" is very difficult to determine with any degree of confidence, if the future work is defined at too high a level. Future work must be continually broken down to the lowest practicable level, and as soon as possible, to the cost account level.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up. (See above for added comments on summary level planning packages.)

- d. Does the contractor require sufficient detailed planning of cost accounts to constrain the application of budget initially allocated for future effort to current effort? (Explain constraints.)

IntGd Text

Any system of management and control incorporates checks and balances as a means of ensuring a disciplined and consistent application of the theoretical standards on which that system is based. One such check in the C/SCSC is to restrain the contractor from

providing current work with over-generous budgets to the detriment of downstream work. This question implies that sufficient detailed planning of cost accounts will prevent functional managers from applying future budgets to near-term work. In actuality detailed planning of cost accounts will not fully ensure this constraint. But detailed advance planning will help to ensure that sufficient budget is retained for and provided to downstream work. In a fast-track design/build environment, this detailed advance planning is particularly difficult to achieve. This criterion question, in conjunction with the previous one, helps to focus on the potentiality of such a problem and specifically requires administrative and procedural safeguard to minimize it. The Joint Implementation Guide Criteria Checklist requires that the contractor have such a constraint formally written into his management/control system description and it further requires the System Reviewer to explain this constraint in the Validation Report. In this way there may be no confusion on the intent of the C/SCS Criterion. Not only will this requirement prevent a dubious Performance Measurement Baseline, but it will also ensure reasonable performance targets throughout the life of the contract.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation:

Agree with interpretation, as written, although here is another area where responsible manager could replace functional manager.

I7 Interpretation:

I do not agree with the write-up as it seems inflammatory. If summary level planning is used and cost accounts are planned in detail for all authorized work the loading of budget will reflect the way an activity is really going to happen. By retaining appropriate budget at higher levels the program will insure that future activities have adequate budget to effectively implement performance measurement over the life of the contract.

- e. Are cost accounts opened and closed based on the start and completion of work contained therein?

IntGd Text

Cost accounts are, among other things, identified by the C/SCSC as the most valid place for the collection of actual costs. In practice it is often observed that cost accounts, by virtue of their cost collection role, risk erroneous changes, both intentional and unintentional. To prevent excessive charges to cost accounts and to minimize erroneous changes, cost accounts should be open, and allow cost collection, only while work is being accomplished in accordance with their work scope. An accumulation of the work packages and planning packages composing a cost account should define the expected start and completion of work for that cost account. The actual beginning date of the first work package should mark the real opening date of the cost account; the completion of the last work package should mark the closure of the cost account. Costs should be collected only during the intervening months. If there is an intervening month where no work package has work being accomplished, the cost account should be closed for cost collection purposes. The System Reviewer, therefore, should seek evidence of both

procedural safeguards in the system description and evidence of disciplined adherence to these constraints.

G2 Interpretation:

Cost accounts may remain open one or two months after work is actually completed to allow for late charges or errors and adjustments where the wrong account was initially charged.

G3 Interpretation: O.K.

I6 Interpretation:

This interpretation is acceptable except for the statement that "if there is an intervening month where no work package has work being accomplished, the cost account should be closed for cost collection purposes". That sentence is too restrictive, and may be thought to imply that the criterion directs the closure of such cost accounts. If the contractor has procedural safeguards, there could occasionally be legitimate reasons for costs to be incurred in an intervening month where no work package has work being accomplished--perhaps there is rework occurring or some other explainable reason.

I7 Interpretation:

I agree with the write-up except that closing cost accounts when a month has no work package being accomplished implies that partial completions of work in intervening months is not allowed. I would re-word that to say: "when there is no work being done in a cost account, procedures must be in place to insure that no costs are incurred in that account."

**4. ESTABLISH BUDGETS FOR ALL AUTHORIZED WORK WITH SEPARATE IDENTIFICATION OF COST ELEMENTS (LABOR, MATERIAL, ETC.)
(Reference formats 2, 3, and 4.)**

IntGd Text

An integral part of the planning process and of the construction of a Performance Measurement Baseline is the establishment of budgets for all the work authorized on a contract. In performance measurement parlance a budgetary entity is an expression of a scope of work. A Budget at Completion (BAC) of any cost account or WBS element is just another way of saying how much work has to be done. Earlier in the planning stages, after each of the WBS elements was broken down into there subordinate cost accounts, the Cost Account Managers were tasked with breaking down their assigned scopes of work into the individual and specific work tasks (work packages and planning packages) that would be required to accomplish that scope of work. Part of that task was a determination on the part of the cost account manager (CAM) as to what amount of skill (in terms of labor) would be needed to do the tasks and how much of this labor would be required. The CAM also had to determine what materials would be needed to do these tasks and he had to plan for any other company services (such as computer use, etc.) that he would need. This particular criteria follows along after this previous planning activity and requires the contractor to apply dollar values to the labor, material, and other direct charge requirements for which he planned. It further requires that the same total of these budgetary values should be constrained to match that CAM's proportionate share

of the budget value contractually allocated to the contract. It is within this total budget parameter that all the work has been defined. Hence all work tasks to be accomplished must be budgeted within this parameter. Throughout the WBS then, from the highest level down through the Cost Account, and even at the work package level, there will be a budget entity that has been set aside to do each entity of work. And further each entity of work (at any level) can be further defined as to amount of labor, material, and other direct changes that will be required to accomplish it.

G2 Interpretation:

ADD -- Other direct charges are items such as travel costs, computer costs, etc.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

a. Does the budgeting system contain (Provide exhibit.)

(1) The total budget for the contract (including estimates for authorized but unpriced work)?

IntGd Text

The primary and most basic point on which any budget system must work is the budget total. Just as any individual's household budget begins with the amount of expected monthly income as the budget total so also must a contractor's budget begin with an expected income as the budget total. In the case of a contractor the expected income is the negotiated value of each of the contracts he has been awarded. On a contract-by-contract basis then, the budget total is the negotiated contract cost of the initial contract plus that of any directed changes to the contract. It should be recognized that where unpriced change orders are sent to a contractor the contractor is obligated to begin work without benefit of negotiation as to the fair and reasonable price of that change. Since the previous discussion mandated that every work entity planned by the contractor have an associated budgetary value the unpriced change order posses a difficulty in C/SCSC adherence. This difficulty is resolved by the first criterion in the Revisions Section which directs the contractor to "estimate the cost of the unpriced change order and distribute this estimated budget to the functional organizations effected by the change. Given this understanding, at any point in time the budget total is the sum of the original contract's Negotiated Contract Cost (NCC), plus the negotiated cost of any contract changes, plus the estimated value of any unpriced change orders. This summation is called the Contract Budget Base (CBB) and represents the total amount of work authorized on the contract; it is this budget total which will be broken-down and distributed to the functional managers to accomplish all the work tasks required by the contract. Any other amount used as a budget total must be mutually agreed to, by both the government and the contractor.

G2 Interpretation:

This could also address Long Lead Funding where the funding can be applied to a specific lot but it is not desirable to add the long lead funding to the PMB or CBB of the lot being reported on. The Long Lead funding should be reported on a separate report and provide information as requested by the buying activity.

G3 Interpretation: O.K.

I6 Interpretation:

Agree with interpretation, as written; my previous comments regarding functional vs. responsible managers apply here, too.

I7 Interpretation: O.K.

(2) Budgets assigned to major functional organizations? (See checklist Item II, 9ab)

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I7 Interpretation:

This should have some comment to cover the budgets assigned to integrated product or work teams.

(3) Budgets assigned to cost account?

IntGd Text

Once the budget total has been established the contractor must begin the task of subdividing that value proportionately to the functional organizations in accordance with the scope of work for which each organization has responsibility. Ultimately both the work entities and their proportionate shares of the budget must be broken down to the cost account level. In this way budget continues to remain associated with work. But in-so-far as functional managers are assigned responsibility for work accomplishment, budgets can be viewed in alignment with functional managers as well as with work. The purpose of this criteria question is to ensure that this is done, preferable as soon as possible after contract award. The Organization Criteria require that an alignment be made between the CWBS and the OBS to show "who is responsible for what." The vehicle used is normally a Responsibility Assignment Matrix (RAM). A RAM is a chart-type matrix with WBS elements on one axis and OBS elements on the other axis. Via cross referencing, it can reflect which OBS manager has responsibility for which WBS element of work. The System Reviewer may find it advantageous to extend the RAM into a third dimension by dollarizing it. A Dollarized RAM will reflect the budgetary value assigned to each segment of work on the WBS, the budgetary value assigned to each OBS manager to do the work assigned, and the budgetary value of all the cost accounts. The earlier this Dollarized RAM is done the more value it has and the more it facilitates the previous budgeting requirement for advanced planning. Regardless of whether the

Dollarized RAM is used, the contractor must be able to show where in the organization the budgets have been distributed, and what budgetary amount is associated with each cost account.

G2 Interpretation:

The discussion here could also address IPTs which cross functional lines. In most cases IPT will be assigned responsibility for work accomplishment not functional managers. We could address this as functional managers/IPT.

G3 Interpretation: O.K.

I6 Interpretation:

Agree with the interpretation, as written; my previous comments regarding functional vs. responsible managers and IPDT leaders apply here, too. IPDT leaders may completely replace the OBS manager in the budgeting activity.

I7 Interpretation:

I agree with the write-up. Some added scope must be entered for integrated product or work teams.

b. Are the budgets assigned to cost accounts planned and identified in terms of the following cost elements: (Reference formats 3 and 4.)

IntGd Text

Once a scope of work and an associated amount of budget has been assigned to the Cost Account, the Cost Account Manager has the responsibility to plan for the accomplishment of that work within the confines of the budget that has been assigned to him. If the Cost Account Manager was involved in a previous "grass roots" estimating procedure to substantiate the company's negotiation posture, he probably already has a fairly good plan worked out for getting his scope of work done. However, there may be considerable difference between the amount of budget he received to do that work versus the amount of budget he originally estimated that work would cost. So at this point the Cost Account Manager may have to reaccomplish his work plan in order to try to do the job for the amount of work distributed to him. He also will inevitably reaccomplish his resource plan as a means of revising his budget to coincide with the amount assigned to him. Accomplishing the cost account resource plan is the crux of this criteria question. It requires that the budgetary resource plan be devised by element of cost; i.e. labor (in terms of dollars or hours), material (dollars), and other direct charge (dollars). This type of budget segmentation adds discipline and integrity to the cost account's resource plan. It ensures that the correlation is made between every budget dollar and the entity that dollar is supposed to buy (be it a labor task, a material, or some other directly chargeable task or service). Ultimately, by summarizing this budgetary breakdown of all cost accounts, it will be possible to construct a performance measurement baseline for each element of expense. These PMBs can be used later to measure the contractor's progress by resource element.

Establishing budgets by element of cost is fundamental to most cost account managers. However, there may be a couple areas where difficulty can arise. First, it is not

uncommon for cost account managers to account for labor budgets in terms of hours instead of dollars. This is acceptable and does not violate the criteria. However, these hourly units must be converted to dollars at an appropriate point in time for summarization purposes in accordance with the WBS and OBS performance measurement data accumulation requirements of the "Analysis" Criteria. It is not acceptable to summarize hourly units up to a higher level in the WBS or OBS before converting them to dollars.

A second problem area concerns material budgets. The "Accounting" Criteria prefers the contractor to account for materials on an applied basis (at the point of consumption) but allows for materials to be accounted for at various other points such as upon receipt, payment, or inventory issue/withdrawal. Whichever point has been selected as the contractor's point of material accountability should be reflected in the detailed material budgets. In other words, the contractor's point of material accountability should reflect when the contractor actually plans to account for materials. If material budgets are established to show point of consumption of those materials, but the materials are actually accounted-for and reported in the month when they were paid for, a data distortion will be caused due to the failure of the contractor to coordinate his budget plan with his accounting system. (In this case his monthly reports will likely be reflecting a cost overrun in the materials area even though he is using his materials at a rate and amount just as he had planned).

G2 Interpretation:

The last sentence of 2 is questionable, "It is not acceptable to summarize hourly units up to a higher level in the WBS or OBS before converting them to dollars." I think "desirable" is more correct than "acceptable."

I6 Interpretation:

Agree with interpretation, as written, except for the last two sentences of the first paragraph: "Ultimately...resource element." Although there's nothing incorrect about remarking that it is possible to construct a PMB for each element of expense, a student might get the impression that there is a criteria requirement to measure progress by resource element at the contract PMB level, which is incorrect.

(1) Direct labor dollars and/or hours?

G3 Interpretation: O.K.

I7 Interpretation:

Teams should realize that contractors may budget the floor only in hours since the cost account managers often do not have responsibility for burdens, labor rates and the like.

(2) Material and/or subcontract dollars?

G3 Interpretation: O.K.

I7 Interpretation:

As above, material and subcontract values are most typically budgeted in direct cost terms with no burdens but at the supplier's price which represents the contractor's cost.

(3) Other direct dollars?

G3 Interpretation: O.K.

I7 Interpretation: O.K.

c. Does the work authorization system contain: (Prepare sample exhibit.)

(1) Authorization to proceed with all authorized work?

IntGd Text

The work authorization system is what translates the contractor's plans into practice. Having planned to do a series of tasks in order to accomplish a specific scope of work, and having scheduled these tasks and budgeted for them by element of cost, what is the vehicle for actually telling someone to get on with the work and get it done within those schedule and budget parameters? Answer - the work authorization. It is essential that work be authorized before it is performed, this is what disciplines the performing personnel to work toward the planned targets and goals (budget goals, schedule goals, and technical goals as well). Work authorization policies and procedures must be established which discipline the system so that all work currently being performed is formally recognizable by its proper authorization documents. A formal authorization process helps to ensure that all work is fully staffed and coordinated among the various functional departments.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

(2) Appropriate work authorization documents which subdivide the contractual effort and responsibilities within functional organizations?

IntGd Text

The authorization process for all work must establish a clear separation of responsibilities between performing organizations. It must be clearly understood who is responsible for the performance of work. The Responsibility Assignment Matrix referred to earlier as a vehicle for satisfying certain "Organization" Criteria is not sufficient to satisfy this requirement. But it is certainly a starting place from which the contractor should begin formulating the separation of responsibility documents in his work

authorization system. Procedural documentation is extremely important here, to outline how organizations with overlapping capabilities should decide where one organization's work will end and where the next organization's authority will begin.

G2 Interpretation:

The use of IPT may make a rewording of this necessary. It is anticipated that a Program Manager will provide a work authorization to an IPT and not a functional manager unless functional and IPT can be considered synonymous. Generally, an IPT will cross functional lines.

G3 Interpretation: O.K.

I6 Interpretation:

This interpretation should be expanded to include IPDT concepts, roles, and responsibilities.

I7 Interpretation: O.K.

5. TO THE EXTENT THE AUTHORIZED WORK CAN BE IDENTIFIED IN DISCRETE, SHORT-SPAN WORK PACKAGES, ESTABLISH BUDGETS FOR THIS WORK IN TERMS OF DOLLARS, HOURS, OR OTHER MEASURABLE UNITS. WHERE THE ENTIRE COST ACCOUNT CANNOT BE SUBDIVIDED INTO DETAILED WORK PACKAGES, IDENTIFY THE FAR TERM EFFORT IN LARGER PLANNING PACKAGES FOR BUDGET AND SCHEDULING PURPOSES. (Reference format 6.)

IntGd Text

Work packages constitute the basic building blocks of the cost account and are used by the contractor in planning, controlling, and measuring performance. "Work Package" is a generic term for the work tasks with definable end-results that collectively comprise, along with planning packages, each cost account's scope of work. The Glossary of the Joint Implementation Guide explains that a Work Package has all of the following characteristics:

- (i) It represents units of work at the levels where work is performed;
- (ii) It is clearly distinguishable from all other work packages;
- (iii) It is assignable to a single organizational element;
- (iv) It has scheduled start and completion dates and, as applicable, interim milestones, all of which are representative of physical accomplishment;
- (v) It has a budget or assigned value expressed in terms of dollars, man-hours, or other measurable units;
- (vi) Its duration is limited to a relatively short span of time or it is subdivided by discrete value milestones to facilitate the objective measurement of work performed;
- (vii) It is integrated with detailed engineering, manufacturing, or other

schedules.

Of the above characteristics, the one most commonly discussed and argued is the sixth, the requirement for work packages to be of short duration. This requirement, however, is a key feature of the criteria from the standpoint of evaluating accomplishment. It is not intended to force contractors to make "arbitrary" cutoff points simply to have short-term work packages. Work packages should be the natural subdivisions of the planned effort within a cost account; their subdivision of the scope of work should reflect the way in which work will be done. When work packages are of short duration, little or no subjectivity must go into the assessment of work progress; the evaluation of contract status is possible mainly on the basis of work package completions. The longer the work package, however, the more difficult and subjective the progress assessment becomes. For longer work packages it is strongly urged that they be subdivided by objective indicators of progress, such as discrete, interim milestones with preassigned budget values and scheduled completion dates.

Comments (of above notes):

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

- a. Do work packages reflect the actual way in which the work will be done and are they meaningful products done and are they meaningful products or management-oriented subdivisions of a higher-level element of work?

IntGd Text

Two issues are covered by this question but it is necessary to discuss the second issue first. That is, the contractor must have a good workable definition (in his system description and in practice) of what constitutes a work package. This definition must encompass, as a minimum, a delineation of the cost account of which it is a part. Since cost account's data are traceable up through the CWBS and the OBS, in addition to identifying each work package to the cost account of which it is a subordinate subdivision, each work package must also be identified as to its end-result (i.e. what part it has to play in accomplishing the scope of work of the cost account). Unless every work package can be identified to this degree there can be no assurance that all the work being done on a given contract is, in fact, to the benefit of only that one contract.

The second issue of this criteria question deals with the scope of work of the work packages which comprise a cost account. And there are two parts to this issue. First, the contractor must ensure that each package's scope of work authorized matches with the work package description and work statements, goals, and interim milestones of that work package. Only in this way can one be sure that the work authorized within a cost account reflects the way each work task will actually be done. Secondly, the contractor

must ensure that the work packages, taken collectively, reflect the way in which all the work will be done within the cost account to achieve the scope of work assigned to that cost account

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation:

Agree with the interpretation, as written. There's a typo in the above question -- delete "products done and are they meaningful".

I7 Interpretation: O.K.

b. Are detailed work packages planned as far in advance as practicable?

IntGd Text

Primarily what is needed to satisfy this question is a control mechanism in the system description which will give voice to the intent to prevent work from being planned as it is being performed. Contractors should inculcate a planning requirement that ensures that all work is always planned at least "X" months into the future (i.e. planned to the detailed work package level). Normally contractors use three to six months as their requirement for prior planning. This duration is not so important to the government as is the assurance that all work is being planned in advance of its performance data. Within a cost account, that work which is needed in the near future ("X" months) should be planned in detail and satisfy all the definition requirements of a work package. The remaining work, which will be accomplished in a later period of time may exist as a "planning package;" but it still must have an associated amount of budget and time related to the scope of work of that planning package.

G2 Interpretation:

For R&D contracts, contractor system descriptions usually tend to say 3 months. Production contracts tend to stay with the 6 month "rolling wave" concept.

G3 Interpretation: O.K.

I6 Interpretation:

Disagree that contractors should include a planning requirement that ensures that all work is always planned at least "X" months into the future. Due to recent PMJEG Guidance #07, contractors are emphasizing planning as far in advance as practicable, and they are de-emphasizing previous three to six month requirements, although most still require a 30-day window at the very least.

I7 Interpretation:

There is no criteria requirement for "X" months of advance planning. In fact the original intent of the criteria was to have the entire effort planned to its logical conclusion. Because contractors and teams had difficulty dealing with the future, the rolling wave and planning

packages came into being. Since unopened future work packages can be moved, replanned and so on, why not encourage people to plan all the effort and only use planning packages where there is great volatility in the future activity.

c. Is work progressively subdivided into detailed work packages as requirements are defined?

IntGd.Text

The progressive subdivision into detailed work packages is called "rolling wave planning." The "rolling wave" can be visualized as far-term effort being broken down into smaller increments of work as the work draws nearer to its scheduled start date. That is the work filters down through the CWBS to the cost account level and below to planning packages and eventually to work packages. Simultaneously, it is moved in the schedule from the far term into the near term and is planned in detail in terms of schedule, scope of work, measurement milestones, and budget. This "rolling wave" occurs just prior to the advance planning requirement (discussed under the proceeding question) so that work is planned in detail "X" months before the work start date.

G2 Interpretation: O.K.

I6 Interpretation:

Disagree with the interpretation, as written. Fewer contractors are adhering strictly to the rolling wave concept, with planning in detail required "X" months before start date, due to PMJEG Guidance referred to in the preceding question.

I7 Interpretation:

[Same comment as above.] There is no criteria requirement for "X" months of advance planning. In fact the original intent of the criteria was to have the entire effort planned to its logical conclusion. Because contractors and teams had difficulty dealing with the future, the rolling wave and planning packages came into being. Since unopened future work packages can be moved, replanned and so on, why not encourage people to plan all the effort and only use planning packages where there is great volatility in the future activity.

d. Is future work which cannot be planned in detail subdivided to the extent practicable for budgeting and scheduling purposes?

IntGd.Text

Ideally, when a Cost Account Manager receives his work authorization/assignment he will plan, in detail, the total work requirement to satisfy the scope of work, budget, and schedule parameters established for his cost account. To the extent this is possible discrete work packages are developed, and all of these work packages will meet all the definition requirements of a "work package" as was outlined in the previous discussion of this planning and budgeting criterion. However, from a practical standpoint, there are many instances where this is not possible or desirable. There are many legitimate situations wherein only the near term work an/should be defined into work packages. The question then becomes, what do we do with the rest of the budget given to the cost account manager? What about the rest of the work and the additional schedule time?

One solution for this far-term effort would be to have the cost account manager simply account for this effort by the different categories just mentioned. At any point in time he could tell you the total amount of work he has left to accomplish; he could tell you the total amount of budget remaining and the total schedule remaining. However, this is not a good solution because it requires no relationship to be drawn from the work requirement to the budget or schedule. It would not prevent far term budget from being used in the near term, for example. Instead all work which is not planned to the detailed degree of a work package must at least be subdivided into planning packages. A planning package has most of the characteristics of a work package except that the definition is in "grosser" detail. Most importantly, however, it requires the inter-association of work, budget, and schedule. The far-term effort will, therefore be broken down into large chunks of work which by their nature are logical segmentations of the total cost account's scope of work. Each of these chunks of work will have a gross dollar budget assigned to it (based upon the estimated cost of doing that chunk of work) and a scheduled start and completion date (in terms of week of month, not day) based upon the approximate length of time that chunk of work should take to be accomplished. As the "rolling wave" proceeds to work then, these planning packages will eventually be planned in greater detail and be converted into work packages.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation:

Agree with interpretation, as written, provided the emphasis is placed on detail planning to the extent practicable.

I7 Interpretation: O.K.

- e. Are work packages reasonably short in time duration or do they have adequate objective indicator/milestones to minimize subjectivity of the in-process work evaluation?

IntGd Text

Every attempt should be made to identify the authorized work within cost account into discrete, short-span, work packages. The completion of such work packages is the best means of measuring accomplishment (i.e., calculating earned value or the budgeted cost of work performed). Long-duration work packages, however, are unavoidable in most contractual efforts (through their propensity varies greatly). In those situations where work packages are greater than two months in length interim milestones, as physical indicators of progress, are strongly recommended. The longer the duration of the work packages, the more the contractor should place importance on the establishment and measurement of progress by milestone accomplishment. Regardless of their length, however, work packages and their inherent indicators/milestones, must accurately represent the underlying work. Additionally, should replanning of a work package be necessary, it is tremendously easier to do on short work packages than on long ones. The Revisions Section of the criteria establish specific restrictions on replanning and limits its occurrence to future (un-opened) work packages, only. Long work packages that stretch 6 months to a year in to the future, therefore, limit the contractor's flexibility to

replan his effort. If that same long work package were able to be identified into several shorter-span work packages, replanning would be possible of those un-opened ones existing in the future. So short-span work packages benefit the contractor by virtue of the additional flexibility they provide, and they benefit both the government and the contractor by making performance measurement more easily calculable.

G2 Interpretation:

O.K. Needs to be looked at with reference to PMJEG Decision #5 on internal replanning dated 23 October 1989. There are now two methods of replanning Work In Progress. One is closing the incomplete work package and the second is to replan incomplete future work and adjust the work package budget at completion. This PMJEG also address changes to LOE accounts.

G3 Interpretation: O.K.

G6 Interpretation:

Since open work packages can be replanned, I have deleted the mention of, "...limits its occurrence to future (un-open)...".

I6 Interpretation:

Agree with interpretation, as written, except for the second half of the paragraph, beginning with "Additionally..." and ending with "...easily calculable". PMJEG Supplemental Guidance #05 allows controlled changes to open work packages. Therefore, the statement that replanning is limited to future (un-opened) work packages is not completely accurate. I do not disagree that work packages should be short-span, where it makes sense.

I7 Interpretation: O.K.

- f. Do work packages consist of discrete tasks which are adequately described? (Provide representative sample.)

IntGd Text

Use of the word "discrete" is recurrent throughout the criteria. Generally it refers to "making something separate and individually distinct." When used in conjunction with work tasks or work packages there are generally three ways in which the effort can be made "separate and individually distinct:" In terms of (1) scope of work involved (2) amount of budget assigned and broken down by element of expense (i.e. labor, material, and ODC) and (3) length of time allotted to accomplish the effort with specific identification of start, stop, and milestone accomplishment dates. Given these three vehicles all work packages can (and must) be discretely described. And further, sub-tasks (milestones, indicators, and interim goals) can, by these same parameters, be discretely described. Poor description of work tasks within a work package and poor descriptions of work packages themselves, results in effort accomplishment, the progress measurement of which cannot be adequately assessed; arbitrary (rather than discrete) evaluation of earned values will be the result.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

g. Can the contractor substantiate work package and planning package budgets?

IntGd Text

This question, you will note, asks only if the contractor can substantiate his budgets. It does not attempt to define how this substantiation should take place or what types of standards may or should be used to provide budgetary substantiation. The main concern is that reasonable targets be established for getting the work done. The budget provides one such target. And the budget target plays a very important role in the establishment of a sound "performance measurement baseline (PMB)." So it is important that reasonable resource substantiation be provided to justify the budgeting targets that are proposed for all work packages and planning packages. "Estimating work sheets" or other substantiation is necessary to ensure that adequate resource targets have been established.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

h. Are budgets or values assigned to work packages and planning packages in terms of dollars, hours, or other measurable units?

IntGd Text

Some of the data elements required to be collected by the criteria and which are also reported on the monthly reports of performance measurement are the (1) Budgeted Cost of Work Scheduled (BCWS), Budgeted Cost of Work Performed (BCWP), and Budget at Completion (BAC). Of paramount importance to all of these data elements is that they be budgetary figures representing specific increments of work (i.e. they are correlations of budget goals to work authorizations). BCWS is the budgetary value of the work scheduled to be done in a given period of time; BCWP is the budgetary value of the work actually done in a given period of time; and BAC is the total budgetary goal distributed for the accomplishment of a given scope of work. * This particular question seems overly simple but it seeks to remind us of a very important point: all work must have an amount of budget associated to it. Only if this is true can an increment of work be totally defined; it ensures that it is then possible to identify the above three data elements for each segment of work. Below the cost account level (at the work package and planning package level) it is sufficient for the work to be identified by labor hours, material units or quantities, computer hours, etc. rather than in budgetary dollars. But at the cost

account level these resources should be converted to budgeted dollars. The important thing is that below the cost account level, work still must be associated with some increment of value, if not dollars, then hours, quantities, or other measurement units.

* BAC also contains Undistributed Budget, which is a transitory account that is soon to be distributed for a known scope of work.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

There is no criteria requirement for cost accounts to be budgeted in terms of dollars. Many contractors budget cost accounts in hours for labor since their functions are managed and performance evaluated in those terms. A contractor should have the ability to convert the cost accounts to dollars by exception if required for special reporting but teams should not be encouraged to change the way a company manages its labor effort.

i. Are work packages assigned to performing organizations?

IntGd Text

Work packages must be assigned to the organization that actually performs the work, whereas the cost account resides with the organization responsible for seeing to it that the work gets done. Usually these two organizations are the same. However, situations do occur where work transcends (or crosses) the boundaries of responsibility of various organizational departments. Where this occurs, care must be taken to ensure that the cost account is assigned to the correct organization (the organization responsible for ensuring that the work is done within the authorized budget, schedule, and technical parameters). Of equal importance, however, is to ensure that the work packages that comprise that cost account are identified to the organization who is responsible for actually doing the work. This ensures communication between all parties; everyone thus knows who is to do the work and who is to manage the work. As a rule of thumb, if more than 10 to 20 percent of the work is being performed outside the realm of the managing organization, consideration of making a new cost account might be appropriate.

G3 Interpretation: O.K.

I6 Interpretation:

Agree with the interpretation, as written. However, it may be well to modify it to include the IPDT concept.

I7 Interpretation: O.K.

6. PROVIDE THAT THE SUM OF ALL WORK PACKAGE BUDGETS PLUS PLANNING PACKAGES WITHIN A COST ACCOUNT EQUALS THE COST ACCOUNT BUDGET. (Reference format 2)

IntGd.Text

The intent of this criterion is to ensure a discipline-check over the budgets assigned to the cost accounts. As has been discussed before, at any point in time the contractor must be able to account for all the budget authorized on the contract. Also with the exception of management reserve, all budget must be specifically associated with a scope of work. In order to ensure adherence to these two principles the contractor must start at the lowest level of work/budget assignment, the cost account. The cost account managers (all of them) must be able to verify the amount of budget that is associated with each work package and planning package of their cost account. And the cost account manager must be able to verify the intended usage of every bit of budget assigned to his/her account. Since no cost account manager wants to risk accusations of fiscal malfeasance the only way to satisfy the above requirement is to assign all of the authorized budget to the work and planning packages that comprise the cost account. At no time should a cost account manager have an amount of budget that is not assigned to a segment of work. Such an amount would constitute a management reserve and management reserves should never exist at the cost account level. The above practice being true and adhered to by the cost account manager, the CAM should always be able to verify that the sum of the work package budgets plus the sum of the planning package budgets within the cost account equals the cost account budget authorized for that scope of work. If the above can be verified for all cost accounts within the CWBS/OBS then the budgetary basis for the Performance Measurement Baseline can be considered valid as well.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

CHECKLIST QUESTION:

- a. Does the sum of all work package budgets plus planning package budgets within cost accounts equal the budgets assigned to those cost accounts?

IntGd.Text

In order to ensure that the PMB is valid the budgets of all cost accounts which comprise it must be valid. To achieve this all work package budgets plus planning package budgets within the cost account must equal the cost account budget. This criterion may seem to be self evident in that the sum of the elements making up the authorized cost account must equal what is authorized for that cost account. But undisciplined systems without the proper checks and balances have been found to violate this criterion and have planning that exceeds the authorized budget. The system reviewer should ensure that

the contractor's system description gives adequate attention to this requirement and she/he should ensure that the cost accounts do adhere to this summation principle in actual practice.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

7. IDENTIFY RELATIONSHIPS OF BUDGETS OR STANDARDS IN
UNDERLYING WORK AUTHORIZATION SYSTEMS TO BUDGETS FOR
WORK PACKAGES.

IntGd.Text

Earlier it was discussed that in the budgeting process the contractor should be able to reflect in his budget, by virtue of the way he planned to do the work, what part of the budget was for labor, what part was for material, and what part was for other direct charges. This criterion goes one step further. It requires that the contractor be able to substantiate how he arrived at the budgetary amounts assigned to each cost account manager. In other words, if a CAM has a labor budget of \$50,000, a material budget of \$35,000, and an ODC budget of \$15,000, we want to know how he arrived at those figures. For the scope of work the CAM has to do, how does he know how much labor will be needed and what skill level these laborers must be? How does he know what materials will be needed and in what quantity? How does he know what other direct charges he will have? The answer from the contractor is that he is basing his estimates on some type of standards: engineered standards, historical standards, industry-wide standards, geographic standards, independent technical testing standards, etc. But specifically every cost account manager should be able to explain what standards he used to come up with the budget distribution he is reflecting for each work package and planning package within his purview. Lastly, this criterion requires that the work authorizations, which formally tie each scope of work to each amount of budget, also be based upon the same standards as were the cost accounts' work and planning package budget/work relationships. This having been done the contractor (and the system reviewer) can validly evaluate the contractor's (albeit his cost account managers) actual progress as work is done. They can say, "On the other hand, our engineered standard showed we would need "X" hours of "Y" skill level to do this job. On the other hand, in practice we found that instead we needed either X + Z hours of "Y" skill level, or "X" hours of skill level "W" to do the job. It is the underlying standards that force budgets to be constructed validly. And it is the budgets that are used in the Performance Measurement Baseline to measure the contractor's performance against.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation:

Agree with the interpretation, as written, but should emphasize that this question primarily addresses manufacturing work packages.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

- a. Where engineered standards or other internal work measurement systems are used, is there a formal relationship between these values and work package budgets? (Provide samples showing relationships.)

IntGd Text

The need for budgets to be based on standards has just been discussed. This question attempts to ensure that the relationship of the budget to a particular standard is legitimate. Especially where an internal standard is engineered and is unique to a single scope of work, some justification of the applicability of that standard to that work's budget should be established. Budgets should never be pulled out of "thin air." Even where a subjective guess seems all that is available, some standard is used by the guesser for making his estimate. So regardless of the subjectivity involved, all budgets must have a justification of legitimacy offered by the work manager to represent how the budgetary goal was established.

G2 Interpretation:

A problem with this criteria is when specific engineering standards Class I are used to establish a budget but in effect there is insufficient budget to allow the standard. Therefore, a factor has to be applied and the realization factor considered.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

- b. Where "learning" is used in developing underlying budgets is there a direct relationship between anticipated learning and time-phased budgets?

IntGd Text

This subquestion was not in the JIG before 1 October, 1987. Paragraph 3.3.d(5)(f) specifically addresses this issue:

A contractor must utilize anticipated learning when developing time-phased BCWS. Any method used to apply learning is acceptable as long as the BCWS is established to represent as closely as possible the expected ACWP that will be charged to the cost account/work package.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

G6 Interpretation:

I view this is only being relevant only during production since EMD is so iffy. This needs to be rewritten. It sounds like it was added due to pressure but with very little research. The question says "where learning" but interpretation says "a contractor must utilize".

I6 Interpretation:

Both question **a** and **b** (in my opinion) pertain more to production effort than to engineering effort. Learning curves and engineered standards are usually the purview of the manufacturing touch labor organization. In fact, paragraph 3-3.d(5) specifically addresses manufacturing work package considerations.

I7 Interpretation: O.K.

8. IDENTIFY AND CONTROL LEVEL OF EFFORT ACTIVITY BY TIME-PHASED BUDGETS ESTABLISHED FOR THIS PURPOSE. ONLY THAT EFFORT WHICH CANNOT BE IDENTIFIED AS MEASURED EFFORT OR AS APPORTIONED EFFORT WILL BE CLASSED AS LOE.
(Reference format 6.)

IntGd Text

All directly costed effort on a contract falls within one of three categories of effort: discrete work packages, apportioned work packages, or level of effort activities. The prerequisites of a discrete work package have been previously defined, but generally they are the increments of work which have a definable end product when completed, which are specifically budgeted by element of expense in accordance with underlying standards, and which are specifically scheduled, to the day, for opening, interim milestone measurement, and completion. Apportioned effort work packages can be just as discretely defined as discrete work packages. But apportioned effort tasks are unique because they bear a close association of dependence upon another discrete work package. If this degree of association can be identified and quantified then the apportioned work package can be planned and measured for progress as a proportionate factor of its base work package's plan and progress. The last type of effort is called "Level of Effort" (LOE). It also adheres to the same budgeting requirements as discrete effort. Like discrete effort LOE also has to be scheduled, to the day, for opening and completion. However, LOE activities are characterized by having no innate, interim milestones which could otherwise be used for progress evaluation purposes. LOE activities have no definable end product which can be evaluated for adequacy upon completion. An example of an LOE activity might be a cost account managers job. His task is to manage but at the completion of his task he has, himself, turned out no end product - he has just managed others who may have turned out an end product. At any point in time it is difficult to ascertain his progress in the total management effort. One could have counted his phone calls, letters written, meetings attended, and counseling sessions held, but all of these together would not be

capable of indicating the amount of the total management effort that had been accomplished. This type of effort, then, is very hard to measure with any precision. All we know about it is how much the CAM is budgeting for his own management effort each month and what day his management effort begins and ends. Consequently, the rule of thumb for LOE activities is to not even try to measure their progress. Their progress measurement is based, simply, on the passage of time; they will always get credit for doing what they planned ($BCWP = BCWS$). A schedule variance will never be possible, then, in an LOE task. If a CAM has an assistant one month that he had not previously planned for, he will incur a cost variance by virtue of having to claim two salaries against his cost account that month instead of just his own. Because of the assumption of work progress that is given to LOE tasks, it is essential to minimize the categorization of work as LOE to only those tasks which cannot be identified as discrete or apportioned. And because of the immeasurability of LOE as to scheduled work progress it is important to keep track of the performance measurement of LOE activities separate from the discrete and apportioned work packages.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

- a. Are time-phased budgets established for planning and control of level of effort activity by category of resource: for example, type of manpower and/or material? (Explain method of control and analysis).

IntGd Text

As was just discussed, LOE progress is measured with the passage of time. In order for this to be possible the budget for an LOE activity must be time-phased. It is this spreading of the LOE resource budget that decides what the performance measurement baseline will be for an LOE task. A common misconception concerning Level of Effort activities is that their budgets must be level-loaded. To be sure, LOE budgets may be level loaded, but they don't have to be. In the case of a Cost Account Manager's task of managing a cost account, assuming that the CAM gets \$1,200 per month, if he is working on only this one contract and has no other managerial assistance, his LOE Budgeted Cost of Work Scheduled (BCWS) each month will be \$1200 (i.e. the budget for the task will be level loaded). But if the CAM has a management assistant in months 2, 5, and 7, then in those months the BCWS would be \$1,200 + the salary of the management assistant. So the key budgeting principle in an LOE task is to time-phase the budget plan but to be sure this budget plan (the monthly BCWS) reflects how the LOE work is actually expected to be done.

Another common misconception with respect to LOE is that LOE tasks are always labor activities. This is simply not true. LOE activities may be in the labor category, they may be material or subcontract, or they may fall in the category of other direct charges. This being true, it is important for LOE activities (just as for discrete and apportioned work

packages) to have the budgets broken out by element of expense.

Since LOE has the capacity to drastically distort evaluations of contractor progress when its performance data is combined with that of discrete and apportioned work packages, special attention must be given to the contractor's system description. Ensure that it incorporates a good definition of LOE, and that it has positive statements concerning the time-phasing, by element of expense, of LOE budgets. Rigorous policies for the control and analysis of LOE activities, budgets, and schedules is paramount to this LOE Criterion.

G2 Interpretation:

Should add information from PMJEG #5 23 Oct 89--"Replan future LOE to correlate to the changes in work." LOE whether planned in separate cost account or as a part of predominately discrete cost accounts, has additional flexibility and may be adjusted within the current accounting period, without government approval provided no actual costs (ACWP) have been charged to the LOE.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

b. Is work properly classified as measured effort, LOE, or apportioned effort and appropriately separated?

IntGd Text

Because it is assumed that actual LOE progress is equal to the amount of LOE work planned (i.e. BCWP = BCWS), LOE activities are relatively easy to plan, measure, and generate performance measurement data for. Unfortunately, because of this relative ease of working with LOE, it is often selected as the category of effort for work packages that should actually be measured discretely. A positive and rigorous review of actual work package plans is required to ensure proper classification of the effort involved. ONLY that effort which CANNOT be identified as discrete or apportioned work packages may be classified as LOE. Once classified every attempt should be made by the contractor to ensure that LOE performance measurement data is not summed with that of discrete or apportioned work package within a cost account. Such summarization is only acceptable above the cost account level, never below.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation:

The last two sentences, beginning "Once classified..." and ending "...never below" are too rigid, and do not reflect the actual guidance in paragraph 3-2.e(3) of the JIG, which permits intermingling provided it is a small amount and strictly controlled.

I7 Interpretation: O.K.

9. ESTABLISH OVERHEAD BUDGETS FOR THE TOTAL COSTS OF EACH SIGNIFICANT ORGANIZATIONAL COMPONENT WHOSE EXPENSES WILL BECOME INDIRECT COSTS. REFLECT IN THE CONTRACT BUDGETS AT THE APPROPRIATE LEVEL, THE AMOUNTS IN OVERHEAD POOLS THAT WILL BE ALLOCATED TO THE CONTRACT AS INDIRECT COSTS. (Reference DCAA Audit Manual and FAR 31.203) (Reference format 7.)

IntGd Text

Indirect costs account for a major portion of the costs of any program. As such the budgetary control and management of this category of cost cannot be overlooked or minimized. Indirect costs exist in essentially three different modes. First are overhead costs for services that benefit more than a single contract. Routine machine maintenance on the manufacturing lines, for example, is a service or type of effort that must be done to keep the machines operational. But while this maintenance activity may be accomplished in a time-frame when only one contract is being worked-on, all of the contracts using those machines benefited from that maintenance service. So this type of indirect cost must be shared by all of the benefiting contracts. A second type of indirect cost is the burden that all contracts must share for such commonly used commodities as electricity and other utilities, employee fringe benefits, taxes, office supplies, and off-the-shelf nuts and bolts. And a third type of indirect cost is classed as "general and administrative" expenses (G&A). G&A is most commonly termed the expenses of the corporate offices (salaries of the chief, corporate executives and their staffs, their office facilities, and their general operating expenses) that all of the contracts must bear a portion of paying. Regardless of the type of indirect cost involved, however, one thing is sure-like any other cost requirement anticipated on a contract, they must be budgeted for. Without this budgeting requirement no baseline can be constructed against which contractor performance/progress may be measured. As a matter of administrative ease, most contractors collect and budget for indirect costs by pools, or burden centers. Such pools are nothing more than the lumping together of similar indirect costs into homogenous groupings. Once indirect costs are collected in pools, the contractor must identify and substantiate the pro-rata share of each pool that each contract must bear. The criteria questions that follow make no attempt to dictate the structure of these pools nor do they attempt to standardize what costs these pools must collect. They do, however, attempt to force the contractor to clarify how his overhead budgeting procedures work and they require the contractor to ensure that his employees do, in fact, follow these prescribed overhead budgeting procedures.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation:

Agree with interpretation, as written, but wonder if it wouldn't make more sense to move discussions of overhead rates and budgets to the Accounting Section of the check list.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

- a. Are overhead cost budgets (or projections) established on a facility-wide basis at least annually for the life of the contract?

IntGd Text

It is imperative that the contractor's overhead budgets be established using a reasonable basis of projected future business activity. The contractor's basis for establishing overhead budgets must take into account the continuation of existing business and the anticipated loss of existing business based on marketing intelligence. The contractor's facility-wide business base is extremely sensitive to market conditions such as a loss of existing contracts, the receipt of unanticipated contracts and the growth or shrinkage of existing markets associated with political, social, economic or environmental conditions. These changes in the direct business base affect the associated overheads. Consequently, it is imperative that the contractor establish overhead budgets on a facility-wide basis at least annually and these should reflect his best estimate of the future business base. Also, since overhead budgets are applied to future periods and are then reflected as an integral part of contract estimates at completion (EAC), it is necessary for these overhead budgets to be periodically reviewed and revised to reflect changes in the contractor's anticipated business base.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

- b. Are overhead cost budgets established for each organization which has authority to incur overhead costs?

IntGd Text

In order to maintain a feeling of responsibility for the incurrence of indirect costs it is important that all managers in the contractor's functional organization be identified to the indirect services they choose to use. Each functional organization which has the authority to incur indirect costs should be accountable for the establishment, maintenance, and control of its own overhead budget. This overhead budget must be established well in advance of any actual overhead incurrence and will represent a planned baseline to measure actual overhead expenditure against. As actual overhead usage occurs and the associated indirect costs are traced to the authorizing manager, responsibility for that overhead usage becomes fixed and analysis of actual versus planned overhead expenditure can be evaluated. When responsibility for overhead budgets is not established and identified to specific using organizations, there is little opportunity to influence the expenses that contribute to those overheads. The lack of clear identification of responsibility and control of the functional organization's indirect

- costs can lead to serious cost-growth problems of contracts.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

c. Are all elements of expense identified to overhead cost budgets or projections?

IntGd Text

Just as was required in the direct cost budgeting area, so also are indirect cost budgets required to be broken down by element of expense (indirect labor, indirect material, and other indirect charges). This information, taken along with the counterpart direct cost information provides a viable performance measurement baseline, by element of expense, on the total contract. Before this segmentation by element of expense can be done, however, it is important for the contractor to ensure that he has constructed a listing of each overhead expense category item (e.g. material handling, marketing research, etc.). This listing should be compatible with the listings used to establish the functional organization on budgets. Naturally, it is imperative that this listing be a complete one. If all expense items are not included in the overhead budgets, the actual indirect costs incurred on the contract will exceed the budgets and contribute to unfavorable indirect cost variances. Additional consideration should also be given to ensure that these overhead expense category items are clearly identified to eliminate the possibility of double accounting. This would preclude the chance of accounting for an expense item as both a direct charge and an indirect charge. Once the list of expense items is ascertained to be complete, its segmentation by indirect element of cost can be accomplished.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

d. Are overhead budgets and costs being handled according to the disclosure statement when applicable, or otherwise properly classified (for example, engineering overhead, IR&D)?

IntGd Text

The contractor has the responsibility to propose overhead budgets and to account for these budgets and the distribution of actual overhead costs in accordance with the government approved Cost Accounting Standards (CAS) "disclosure statement." In the absence of a CAS "disclosure statement," the contractor has the responsibility to handle

overhead budgets and costs in accordance with "generally accepted accounting practices." If overhead budgets and costs are not handled consistently, there is a tendency for inequity to exist in the application of costs among the contracts. It is important to ensure that overhead costs are equitably distributed to each customer. This "equitable distribution of costs" is an extremely sensitive area when there is a mix between government and commercial business.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

- e. Is the anticipated (firm and potential) business base projected in a rational, consistent manner? (Explain.)

IntGd Text

Unlike direct cost budgets, which are established on a contract-by-contract basis, overhead budgets must be established on a facility-wide basis for a set increment of time (usually one year). This construction of overhead budgets by the contractor must be periodic then, and this function should be performed in a rational and consistent manner. It should be neither overly optimistic nor overly pessimistic. It should include considerations such as continuation and growth of existing contracts, the projected total market in the business arena, the probability and magnitude of future business, and other factors influencing the business volume. A special concern here, is the natural tendency for contractors to be optimistic in predicting future business. When future sales are overstated, the result is an understatement of the associated overhead budgets. Then as actual overhead costs are incurred under these circumstances, the result is cost growth.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

- f. Are overhead cost budgets established on a basis consistent with the anticipated direct business base?

IntGd Text

The contractor, in establishing his overhead budgets, should be able to demonstrate a logical relationship between the anticipated direct business and the associated overhead budgets. If the direct business base is projected to increase there is potential for increase in certain expense categories necessary to support this growth. If the direct business base

is projected to decline, there is probably justification for reducing certain support services. In either case, the associated overhead budgets will need to increase or decrease to support the projection of business growth or loss; there should be a logical explanation for the relationship of overhead budgets to the direct business base changes. Where careful consideration is not given during the planning phase of the budgeting cycle to factors such as the changes in the anticipated direct business base, there is a high degree of probability that items contributing to the overhead budgets will be understated or overstated.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

g. Are the requirements for all items of overhead established by rational, traceable processes?

IntGd Text

The contractor must have well-documented instructions and work sheets which portray how the overhead budgets are established. Paramount to this requirement is the assurance that all overhead services being budgeted are, in fact, necessary. This question insists that the contractor be able to trace the budgeted overhead services back to a justifiable requirement for that service. Further, the System Description should specify that this traceability exist and that the justification for overhead requirements be rational. Overhead budgets must be established by responsible functional organizations utilizing the same fundamental ground-rules. Adjustments to the overhead budgets as a result of changes in the direct business base, for example, must be a result of a changing need for overhead services. This changing need must be justified and quantified.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

h. Are the overhead pools formally and adequately identified? (Provide a list of the pools.)

IntGd Text

Cost Accounting Standards "disclosure statements" submitted to, reviewed, and accepted by the cognizant government audit agency must clearly identify the composition of overhead pools. In the absence of a required CAS disclosure statement, the contractor's internal accounting system description should formally identify each cost collection pool

and the composition of expenses collected into each pool. Formal and adequate identification of overhead pools during the budgeting and cost collection process will minimize the probability of double-counting or miscounting indirect expenses.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

- i. Are the organizations and items of cost assigned to each pool identified?

IntGd Text

Just as it is necessary to identify the individual overhead pools for the budgeting and collection of indirect costs, it is also necessary to identify specifically the individual organizations and the individual items of cost (by category and type of manpower, where appropriate) to be charged to each pool. The contractor has the responsibility of identifying each of these contributors to each of the pools so that duplication of costs does not exist. Only in this way can the overhead budgets be projected with an assurance of completeness.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

- j. Are projected overhead costs in each pool and the associated direct costs used as the basis for establishing interim rates for allocating overhead to contracts?

IntGd Text

The contractor has the responsibility to demonstrate that the projected overhead cost for each overhead pool be used in conjunction with the projected direct cost base in establishing interim rates for allocating indirect costs to contracts. As the overhead services needed to support the direct base changes, and as the direct base itself changes, the contractor will need to change his projected rate of pro-rating the overhead costs to the contracts composing his business base. If interim rates for allocating overhead to contracts are not based on direct costs and the projected overhead services needed to support them, but rather on some arbitrary method, the validity of the projected "at-completion" costs may be questionable. Further, if the overhead costs in each pool are not related to and based upon the anticipated direct costs, it may be necessary for the contractor to make frequent adjustments to the "cumulative-to-date" costs for billing purposes (not all of which may be justifiable).

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

k. Are projected overhead rates applied to the contract beyond the current year based on-

(1) Contractor financial periods; for example, annual?

(2) The projected business base for each period?

(3) Contemplated overhead expenditure for each period based on the best information currently available?

IntGd Text

Overhead rates projected beyond the current year should be developed by the contractor at the same time that the annual projections are made. Normally, contractors make an annual five-year forecast based on existing and anticipated future market conditions. This five-year forecast serves as the basis for projected capital expenditures, staffing, and inventory planning. It also normally serves as the basis for agreed-to forward pricing rates to be used in bids and proposals. Projected overhead rates should be directly related to the contractor's own five-year forecast. Where corporate five-year forecast are not required, projections of business bases and overhead expenditures beyond the current year should be made at least on an annual basis using the same methodology as for the current year. On a multi-year contract, overhead rates that apply to the contract beyond the current year, normally contribute to at least one-half of the remaining "Contract Budget Baseline" (CBB). If the same amount of care is not exercised in the application and preparation of the projected overhead rates for future periods, the projected contract "Estimate At Completion" (EAC) could be seriously understated or overstated. Future year projections should periodically be reviewed; adjustments should be made to the overhead expenditure projections for changes in market conditions that will affect the contemplated overhead expenditure or projected business base. Where forward pricing rates are reviewed by the local government audit agency, updates to future projections are required at least on an annual basis.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

- I. Are overhead projections adjusted in a timely manner to reflect:
 - (1) Changes in the current direct and projected base?
 - (2) Changes in the nature of the overhead requirements?
 - (3) Changes in the overhead pool and/or organization structures?

IntGd Text

Contractors normally develop new overhead projections on an annual basis. Generally these projections are reviewed and revised (up or down) on at least a semi-annual basis. Where significant changes occur in the current or projected business base that significantly affects the overhead projections, an adjustment should be made to the overhead projection. These overhead adjustments should normally be implemented within two accounting periods (which should be specified in the contractor's System Description) or as agreed to by the local governmental audit agency. Changes to overhead pools or organizational structures which significantly affect overhead projections, or changes in the amount of overhead services needed to support the business base, should also be implemented within two accounting periods or as otherwise agreed to by the resident government auditor. The utilization of projected overhead rates based on an anticipated business base and commensurate overhead expenditures is intended to provide the customer with insight as to funding requirements and expected overall project cost. It is imperative that the contractor's system for projecting overheads have the built-in flexibility to be adjusted when changes will make future projections of overhead unrealistic.

G2 *Interpretation:* O.K.

G3 *Interpretation:* O.K.

I6 *Interpretation:*

Where does the JIG specify that overhead adjustments should be implemented within two accounting periods? Interpretation should not "plant" specific durations in the students' minds. The JIG question only says "timely".

I7 *Interpretation:* O.K.

- m. Are the WBS and organizational levels for application of the projected overhead costs identified?

IntGd Text

It is not necessary for the contractor to establish overhead budgets and collect overhead costs at the cost account level of the WBS or OBS. It is, however, necessary for the contractor to identify the level at which overhead budgets and actuals are applied and accumulated. The level where overhead actuals are collected must previously have established a budget for those overhead services projected to be used. Regardless of the level of this functional organization (at which overhead budgets and actuals are

collected) it is imperative that the responsibility for the management and control of all overhead budgets be clearly identified. There should be no co-mingling of responsibility for the control of overheads. For example, the sharing of responsibility for management and control of a single overhead pool should be avoided wherever possible. There are at least two theses regarding the control of overhead responsibility at the lowest planning level in the organizational structure. Under one philosophy the cost account manager is provided a total budget, including overhead, and has the responsibility to maintain cost control within that budget regardless of the impact of overhead on his accounts. That is, if higher than budgeted indirect costs are incurred, it is expected that a reduction in the direct labor and materials accounts will be implemented in order to maintain a within-budget condition. Conversely, there are those that maintain that the working level functional manager has little control or influence over overhead budgets and actuals and therefore should only be responsible for direct labor and material. Under this circumstance, overhead budgeting and collection of actuals would occur only at the higher management level of the functional organization and be summarized from there, up to the total contract level. Whichever philosophy prevails, it should be understood that the customer's concern is with the overall cost of the project or program. This overall cost includes the associated overheads. It is, therefore, necessary that the organizational level where this responsibility exists be clearly, and unmistakably, identified.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

10. IDENTIFY MANAGEMENT RESERVES AND UNDISTRIBUTED BUDGET.

IntGd Text

While this criterion says only to identify Management Reserve (MR) and Undistributed Budget (UB) its intent is to ensure that through diligent identification (identification in terms of amount of location) MR and UB will be separately controlled. The importance of this segregation and control lies in the definitions and uses of MR and UB. Management Reserve is that portion of the total Contract Budget Base (CBB) that is withheld by the contractor (i.e. not distributed) for management control purposes. Contractors normally withhold management reserves for two purposes. First is to incentivise the lower-level managers to do the job as cheaply as possible. Rather than distribute all the budget along with all the work authorized on the contract a certain amount is withheld as MR. Wishing to keep their jobs secure the lower-level managers will try to get their jobs done for the amount of budget distributed to them. Hence MR can be used for incentive purposes.

The second use of MR is as a contingency fund, to provide budgeting goals for unanticipated program requirements that will impact the future effort. Looking back historically, most contractors can document for each contract the cost of problems and other program requirements that were unknown at the time of contract award. Using this as a valid experience, after each new contract is negotiated, an amount of that

contract value is withheld from distribution. It is called a management reserve and represents an amount of budget that the contractor is pretty sure he will have to spend before the contract is complete but he doesn't know on what he will spend it. Hence MR may be a contingency fund. In reality, MR serves both purposes at the same time. Once withheld from the CBB, it provides an incentive to do the job for less and at the same time provides management with a contingency fund for future unknown requirements. Since MR is withheld from distribution and maintained at the higher management levels, it is not a part of the time-phased Performance Measurement Baseline. By formula, the value of MR can be determined as follows:

$$\text{CBB} - \text{BAC of PMB} = \text{MR}$$

Undistributed Budget (UB) is budget that is applicable to specific contractual effort which has not yet been identified to CWBS elements at or below the lowest level of reporting to the government. UB classically exists as a transient amount. It is part of the negotiated value of a contract or contract change (that is for the accomplishment of a specific scope of work) but which for some reason has not yet been distributed below government reporting level. For the period of time that this scope of work remains undistributed, its associated budget will be classed as Undistributed Budget (UB). Once distributed below the reporting level of the CWBS/OBS it ceases to be UB and instead is incorporated in the Budget of the responsible organization for that scope of work. UB is always considered a part of the BAC of the PMB in spite of the fact that it is not time-phased. This is because it represents Budget for a specific scope of work and because it will only be for a short time that it is not time-phased. Specific attention must be given by the contractor to adequately define and describe what constitutes MR and UB so they cannot be confused by the managerial staff. Further, every attempt must be made to be able to totally identify all budgetary amounts classed as MR and UB; this identification must include the amount of budget involved, where it is located (which CWBS element or OBS element is responsibility for it), and when used, full disclosure of its use must be made.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

- a. Is all budget available as management reserve identified and excluded from the performance measurement baseline?

IntGd Text

Management Reserve budget plays a very special part in the operation of any performance measurement system. The use of MR must carefully controlled and monitored in formal records since its use is indicative of Management's recognition of previously unknown tasks or problems. MR must be identified and maintained separate from the PMB. Plotting the use of MR over time is often a valuable analysis technique.

The identification, maintenance, and use of MR is most commonly documented by the use of a Management Reserve Log.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

b. Are records maintained to show how management reserves are used?

IntGd Text

Since MR plays a special role in performance measurement, the proper use of MR must be carefully understood and controlled. Transactions may be made both to and from the Management Reserve. MR should be used by the Project's Management to budget previously unrecognized tasks that are consistent with the general scope of work of that project. When a planned and budgeted task has become unnecessary, the budget may be transferred to MR. (See the Revisions Criteria for the parameters/restriction on MR transactions). Good records must be maintained of all transactions into and out of the MR budget. These records must be readily available to government representatives reviewing or surveying the contractor's system. These records must identify the reason for the transaction, the amount involved, and the cost accounts affected.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

c. Is undistributed budget limited to contract effort which cannot yet be planned to CWBS element at or below the level specified for reporting to the Government?

IntGd Text

Only those tasks which cannot be adequately defined below the government reporting level should be placed in UB. The placement of budget into a UB account should place a priority on the further definitization of the subject task. It is inappropriate to hold tasks and budget in UB for long periods of time; a maximum period of time should be established for holding tasks in UB. UB is traditionally considered a holding account for contract changes received too late within the accounting month to be distributed down below the government reporting level. Normally this is for a short time duration 30 to 60 days; but there are exceptions when budgets cannot be planned to this degree in this length of time. At the outset of contract award for example, it is often difficult to plan the entire contract down to this level and larger packages of work remain undistributed at

the higher OBS or WBS element level (above the reporting level). But by the end of the first year the entire contract should be planned and budgeted down below the reporting level and in most cases to the cost account level.

G2 Interpretation:

The JIG provides that for work which has not been negotiated, the contractor may maintain budgets in an undistributed budget account until negotiations have been completed, allocating budget only to that work which will start in the interim.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

d. Are records maintained to show how undistributed budgets are controlled? (Provide exhibit.)

IntGd Text

UB records must be maintained to identify all sources and applications of UB while maintaining how much budget is being held at any one time. Remember UB represents an amount of budget negotiated to perform a specific scope of work. Therefore, at no time should UB lose its work identity. When it is finally distributed, UB is authorized along with its associated scope of work. UB records must show which tasks and organizations have been affected by the use of UB during the reporting period. At no time can UB be placed into the MR account to escape the requirement for distribution within the 30 to 60 day time limit. It must always remain associated with specific work.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up except that UB may be in terms of the estimated value of the statement of work when a negotiated value has not yet been established.

11. PROVIDE THAT THE CONTRACT TARGET COST PLUS THE ESTIMATED COST OF AUTHORIZED BUT UNPRICED WORK IS RECONCILED WITH THE SUM OF ALL INTERNAL CONTRACT BUDGETS AND MANAGEMENT RESERVES. (Reference formats 3, 4, and 5.)

IntGd Text

Planning and Budgeting criterion number six required that the sum of all work packages

budgets plus planning packages within each cost account equals that cost account's budget. This criterion builds upon that requirement and goes from the cost account level to the total contract level. Once it can be ascertained that each cost account budget is accurately established as a finite total, it is then necessary to be able to sum all cost account budgets along with any intermediate level budgets and UB to the total that is known as the Budget at Completion of the Performance Measurement Baseline (BAC of the PMB). Having thus validated the sum of the internal budgets it must be ascertained that this value plus that of the MR equals the value known as the Contract Budget Base (CBB) (the CBB is the negotiated contract cost (to date) plus the estimated value of any unnegotiated unpriced-change-orders received to date). Hence, the CBB = MR + BAC of PMB. (Where CBB = NCC + Est. of Unpriced C/Os). There should be no point in time when all budget cannot be accounted for; this truth is exhibited on a monthly basis with the submission of the Cost Performance Report.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

- a. Does the contractor's system description or procedures require that the performance measurement baseline plus management reserve equal the contract budget base?

IntGd Text

This question requires that an intent statement be included in the contractor's system description saying that the contractor will, at all times, maintain complete budget integrity. The government demands assurance on the part of the contractor that he can account for all budget values authorized for the contractual scope of work. Specifically the contractor should have a set of procedures explaining how his management system will ensure that (1) the sum of all cost account and intermediate level budgets plus UB equals the BAC of the PMB; (2) Negotiated Contract Cost plus the estimated value of unnegotiated, unpriced change-orders equals the Contract Budget base; and (3) BAC of the PMB plus Management Reserve equals the CBB. The contractor's management control system must provide for controls and records to ensure that all changes in budget due to normal internal management replanning transactions and contractual actions results in the maintenance of the above mentioned formula.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

b. Do the sum of the cost account budgets for higher level CWBS elements, undistributed budget, and management reserves reconcile with the contract target cost plus the estimated cost for authorized unpriced work? (Provide exhibit.)

IntGd Text

Having ensured that the contractor does indeed, have an intent statement to maintain complete budget integrity, and having ensured that he has a set of procedures that define how this budget integrity can be proven, this last question simply requires that the contractor demonstrate that his procedures are adequate. The contractor must prove, in practice, that all of his cost account budgets are capable of being summed up through each successive level of the CWBS and OBS and be equal to any budget assigned to these levels of the CWBS and OBS. He must prove that the total of all these budgets plus any UB and MR equals the CBB. Any C/SCSC-validated system providing a monthly Cost Performance Report is attempting to reassure their proof of this degree of budget integrity.

G2 Interpretation: O.K.

G3 Interpretation: O.K.

I6 Interpretation: O.K.

I7 Interpretation: O.K.

III. ACCOUNTING CRITERIA

- 1. RECORD DIRECT COSTS ON AN APPLIED OR OTHER ACCEPTABLE BASIS CONSISTENT WITH THE BUDGETS IN A FORMAL SYSTEM THAT IS CONTROLLED BY THE GENERAL BOOKS OF ACCOUNT.**

IntGd Text

It was an original intention of the C/SCSC to maximize the ability to measure performance of government contractors. As part of this intention it was logical and prudent for contractor's accounting systems to be able to account for all resource expenditures on an "applied" basis (i.e. on an "as-used" or "as-consumed" basis). This requirements caused little or no difficulty in the categories of labor (where time cards or other time-measurement devices are used) or other direct charges (where services are rendered on some type of dollarized per-unit basis). However, in the area of material accountability, considerable variation existed between contractors and their respective methods of accounting for material usage. To ease this differential in material accounting methodology the criteria were annotated as follows to give some leeway to the interpretation of what constituted an "applied" basis of material accounting:

Direct material costs shall be those amounts recognized in the time period associated with the consumption of materials without regard to the date of commitment or the date of payment. These amount may be charged to work that is in-process when any of the following takes place: (1) Material are actually consumed; (2) Materiel resources are withdrawn from inventory for use, (3) Material resources are received that are uniquely identified to the contract and scheduled for use within 60 days; (4) Major components or assemblies are received on a line-flow basis that are specifically and uniquely identified to a single, serially-numbered end-item.

But even with this broader interpretation the fact still remained that many contractor's accounting systems simply were not capable of accounting for materials as they were "used". As a result, most contractor's seek to validate the ability of their performance measurement systems to account for materials on an "other-than-applied" basis (i.e. at a point other than at consumption). Of the other points at which material can be accounted for (at commitment, at receipt, at payment, at inventory acceptance, or at inventory release) the only point which the government will not accept is the point of "commitment." For those contractors who seek to account for materials on an "other-than-applied" basis the main thing that must be recognized is the requirement to accounted for materials in a manner consistent with the way in which materials are budgeted. If materials are going to be account for at the point

of receipt, then material budgets should be established based on the point of expected receipt. It is not acceptable to budget for materials at one accounting point and then to actually account for them at another point. To do so would cause distortions in the performance measurement data and reflect incorrect contractor progress status. The seventh accounting criterion will also reference some parameters/restrictions for material accountability.

I7 Interpretation:

I agree with the write-up. However, I believe the criteria should include this in "Analysis" and limit the questions to insuring that costs are accumulated controlled and traceable from the books of accounts to the reports sent to the government. There are more than adequate constraints on the accounting system which receive extensive government oversight.

CHECKLIST QUESTIONS:

- a. Does the accounting system provide a basis for auditing records of direct costs chargeable to the contract?

IntGd Text

Actual resources expended in accomplishing the work must be recorded on the same basis at which resource budgets were assigned if meaningful comparisons are to be made. The contractor's accounting system provides the basis for substantiating all applicable direct costs chargeable to the work effort expended for the contract. Thus the accounting records must provide an audit trail to the source of the cost. This must be done in accordance with generally accepted accounting principles. For example:

- i. Direct labor costs must be supported by time cards or other documents generally accepted by auditors as substantiation for salaries and wages.
- ii. Material records must account for all receipts, issues, scrap, and residual materials. Receipts should be traceable to purchase requisitions, purchase orders, receiving documents, invoice approval/payment records and material issuance documents. Records should also be maintained to account for scrap and the disposal of residual material.

I7 Interpretation:

O.K. See comments above.

- b. Are elements of direct cost (labor, material, and so forth) accumulated within cost accounts in a manner consistent with budgets using recognized acceptable costing techniques and controlled by the general books of account?

IntGd Text

The cost account is the lowest required management control level at which actual costs are to be accumulated and compared to the Budgeted Cost of Work Performed (BCWP). "Consistency of the actual allowable costs with the budgets" means that the effort budgeted has a defined scope/product and that only the actual resources expended to achieve that same scope/product can be accumulated ("charged") against the cost account. Those costs which are allowable as charges fall in one of three classifications:

- i. Labor - wages and salaries paid to hourly and salaried employees for work specifically identified to the product or service being rendered.
- ii. Material - raw materials, parts, subassemblies, assemblies, and components acquired by purchase orders and subcontract and identified to the product or service

being rendered.

- iii. Other direct charges - allowable costs specifically identified to the product or service being rendered that are neither labor nor material. Examples include travel, computer time, agency labor, laboratory effort and testing services.

The above categories of costs must be collected within cost accounts using generally accepted accounting techniques and must be traceable to the general books of account.

I7 Interpretation:

I agree with the write-up. The costs may be segregated into different cost accounts or aggregated into a single cost account depending on the specific contractor's system of cost accumulation and reporting

2. SUMMARIZE DIRECT COSTS FROM THE COST ACCOUNTS INTO THE WBS WITHOUT ALLOCATION OF A SINGLE COST ACCOUNT TO TWO OR MORE WBS ELEMENTS. (Reference format 3.)

IntGd Text

Cost accounts are formed at the juncture where the lowest level of functional responsibility exists for individual CWBS elements. Allowable costs collected within the cost account by elements of expense must "roll-up" from the cost account level through the CWBS to the top level without being simultaneously applied to two or more higher level elements. If the CWBS was carefully developed and reviewed for adequacy in accordance with MIL-STD-881-A, the CWBS structure itself, should prevent any one single element's data from being rolled-up to two or more higher level elements. The reasons for this prohibition should be obvious. First if a roll-up of data to multiple elements were allowed to occur the values of the data would be multiplied by the number of higher-level elements receiving that data. Secondly, if multiple roll-up occurs, one must question the validity of the CWBS to adequately reflect the way work is actually to be done. And thirdly, multiple roll-up of data makes one question who is really in charge of the lower-level element whose data is being rolled-up. Careful development of the CWBS breakdown and the use of "integration/assembly-type" WBS elements will usually preclude the need for common-item Cost Accounts being subsequently allocated to the "using" Cost Account.

I7 Interpretation:

I agree with the write-up. Where identical tasks exist across several WBS elements (as in production material, allocated material, fabrication, etc.) a summary level cost account might be used for management purposes provided that costs can be segregated into the appropriate WBS and OBS elements, performance analyzed discretely and variances reported to the appropriate WBS elements. In this case the Summary Cost Account would have lower level cost accounts as its work packages.

CHECKLIST QUESTION:

- a. Is it possible to summarize direct costs from the cost account level

through the CWBS to the total contract level without allocation of a lower level CWBS element to two or more higher level CWBS elements? (This does not preclude the allocation of costs from a cost account containing common items to appropriate using cost accounts.

IntGd Text

None.

3. SUMMARIZE DIRECT COSTS FROM THE COST ACCOUNTS INTO THE CONTRACTOR'S FUNCTIONAL ORGANIZATIONAL ELEMENTS WITHOUT ALLOCATION OF A SINGLE COST ACCOUNT TO TWO OR MORE ORGANIZATIONAL ELEMENTS. (Reference format 4.)

IntGd Text

This criteria and the one before it are identical with the exception that this one deals with OBS data summarization while the previous one dealt with CWBS data summarization. In either case the intent is the same - the data representing the "Actual Cost of Work Performed" (ACWP) collected at the cost account level may not be rolled-up (i.e. summarized) to multiple higher-level elements. If the CWBS and OBS are properly constructed and if the responsibility assignment matrix adequately assigns OBS responsibility to all CWBS elements of work, it will be extremely difficult to violate the intent of these two criteria.

I7 Interpretation: O.K.

CHECKLIST QUESTION:

- a. Is it possible to summarize direct costs from the cost account level to the highest functional organizational level without allocation of a lower level organization's cost to two or more higher level organizations? (This does not preclude the allocation of costs from a cost account containing minor non-organizational work to the appropriate functional organizations.

IntGd Text

None.

I7 Interpretation:

I agree with the write-up. Don't forget integrated product or work teams. Also remember that product or work teams are cross functional and may have a mix of cost accounts or cost elements included in their data.

4. RECORD ALL INDIRECT COSTS WHICH WILL BE ALLOCATED TO THE CONTRACT.

IntGd Text

The intent of this criterion is to ensure that the contractor has a formal (written) system description that not only requires the recording of all allocable indirect costs, but also explains, procedurally, how these indirect costs are to be recorded. Since we are dealing with a category of cost that is expended to benefit more than a single contract, it is not sufficient for the contractor to state simply that he will record all indirect costs. The government wants to know how his overhead accumulation system works; it wants assurance that all of the contracts benefiting from an indirect cost expenditure will bear their fair share of that indirect cost.

I7 Interpretation:

I agree with the write-up. This whole section is somewhat redundant and could be covered in the sections on budgeting and analysis as much of it deals with controlling indirect costs, not collecting and reporting costs in an accounting sense.

CHECKLIST QUESTIONS:

- a. Does the cost accumulation system provide for summarization of indirect costs from the point of allocation to the contract total?

IntGd Text

The contractor's cost accumulation system must have the capability of summarizing or "rolling up" the indirect costs allocated to the contract from the point of allocation through each successively higher level CWBS element and OBS element to the total contract level. In order for the performance measurement data accumulated on the contract to be useful to the various levels of management, a summarization of that data upwards through the various levels of the CWBS (including all elements of cost, direct and indirect, allowable and allocable) is necessary.

I7 Interpretation: O.K.

- b. Are indirect costs accumulated for comparison with the corresponding budgets?

IntGd Text

Contractor budgets are established utilizing allowable labor and material estimates as the foundation for budget projections. Indirect budgets are applied, as a minimum, at the level where indirect budget control responsibility exists in the contractors management control system. The contractor's accounting subsystem must be established so that those direct costs allocated to the contract can be accumulated at the same level as where the budgets for these indirect costs are established. If the contractor's system does not accumulate indirect costs at the same level where indirect costs are budgeted, cost comparison analysis and potential corrective action cannot be appropriately made.

I7 Interpretation: O.K.

c. Do the lines of authority for incurring indirect costs correspond to the lines of responsibility for management control of the same components of cost? (Explain controls for fixed and variable indirect costs.)

IntGd Text

This question asks one thing, do the overhead lines of authority corresponds to the lines of responsibility? But then, in parentheses, it requires the contractor's controls over fixed and variable indirect costs to be explained. First, the question of authority/alignment the contractor's management organization should be structured such that the manager charged with the responsibility for management and control of specific indirect cost elements has lines of authority extending down through those elements. In contractor's systems where this authority does not correspond with the responsibility, it is not possible to properly control the indirect costs. For example, if Manufacturing Engineering functionally reports to the Manager of the Engineering Department but charges indirect costs to a Manufacturing "burden" pool, the lines of authority and responsibility are not concurrent. Control of the contribution to the manufacturing pool by manufacturing engineers would be extremely difficult since the Manufacturing Manager has no control or authority over the Manufacturing Engineering personnel.

As for the subject of fixed and variable indirect costs, a definition for each is in order. Fixed indirect costs are those which remain relatively constant on a total basis, as production volume is varied over the shortrun. Examples of such fixed costs are fire insurance, machinery depreciation, rent, and property taxes. These costs will remain relatively fixed over a relevant range of production. Of course, if production requirements change "significantly" from this relevant range, even in the short run, the fixed cost assumption could disintegrate. Variable indirect costs on the other hand, are those which fluctuate directly and proportionately on a total basis with changes in production volume over the short run. Examples of such variable costs include indirect manufacturing labor, indirect materials, and sales/marketing functions.

Each of these types of indirect costs pose unique problems for those who would control and authorize their use. Each type has an affinity for crossing standard departmental lines of functional responsibility. Hence, when a contractor seeks to establish procedures for aligning overhead authority with overhead responsibility, he should specifically address the problem of fixed versus variable overhead costs and outline procedures for controlling each type without violating the precepts of direct lines of authority.

I7 Interpretation: O.K.

d. Are indirect costs charged to the appropriate indirect pools and incurring organizations?

IntGd Text

The contractor has the responsibility through his own internal audits to assure that indirect charges are properly applied throughout the accounting structure. The contractor also has the responsibility to assure that such costs are not duplicated (i.e. that they are not charged to more than one pool nor charged to both an indirect pool and at the same time to a direct/allowable cost element). Because of the nature of pooled

costs, entry errors are more difficult to detect than with direct costs. Periodically, reviews should be made to assure that indirect costs are being charged to the appropriate indirect pools and by the appropriate incurring organization.

I7 Interpretation: O.K.

e. Are the bases and rates for allocating costs from each indirect pool consistently applied?

IntGd Text

The allocation of cost to a product, contract, or other cost objective should be the same for all similar objectives. That is, if direct labor dollars is the basis for allocating over-head on one contract, it must be the basis across all contracts. Unless identical bases and rates for allocating costs among contracts are utilized for allocations from indirect cost pools, double accounting or over-allocation and under-allocation of the pool costs is likely to occur.

I7 Interpretation: O.K.

f. Are the bases and rates for allocating costs from each indirect pool to commercial work consistent with those used to allocate such costs to Government contracts?

IntGd Text

Contractors who used pooled costs and allocation of such costs to contracts must allocate such costs to government contracts and commercial contracts on an identical basis. This requirement for consistency is intended to minimize the possibility of selective application of indirect costs to gain an unfair profit. For example, if a contractor had a cost-reimbursable government contract and a firm-fixed price commercial contract as unfair advantage could be gained by the contractor on the commercial work by not charging enough indirect costs (via a lower rate) to the fixed-price commercial work. And by the same inappropriate procedures the Government would be paying more than its fair share of the overhead expenses.

I7 Interpretation: O.K.

g. Are the rates for allocating costs from each indirect cost pool to contracts updated as necessary to ensure a realistic monthly allocation of indirect costs without significant year-end adjustments?

IntGd Text

The contractor has the responsibility to periodically review the allocation formula utilized for indirect costs to assure that they reasonably reflect the actual indirect costs being incurred. If incurred indirect costs vary significantly from those included in the allocation formula, periodic adjustments should be made to prevent the necessity for a significant end-of-year adjustment. Many contractors are currently making such indirect cost adjustments on a monthly basis by utilizing cumulative data information rather

than single-month data as the basis for allocation of indirect costs to contracts. Unless these periodic adjustments are made when actual indirect cost rates vary from those budgeted, contractor data being generated by the performance measurement system will be distorted.

I7 Interpretation: O.K.

h. Are the procedures for identifying indirect costs to incurring organizations, indirect cost pools, and allocating the costs from the pools to the contracts formally documented?

IntGd Text

The contractor must have formal (written) procedures for identifying the indirect elements which contribute to each cost pool. They must also identify the method used to allocate costs from the pools to the using contracts. And they must identify how they are identifying indirect costs in the incurring organizations. Normally these descriptions will exist in the contractor's accounting manual or internal accounting instructions. The contractor must perform periodic internal audits of the system to ensure that the procedures describing the handling of indirect costs are being adhered to.

I7 Interpretation: O.K.

5. IDENTIFY THE BASES FOR ALLOCATING THE COST OF APPORTIONED EFFORT.

IntGd Text

Appportioned effort was previously defined under the Planning and Budgeting criteria. It is effort which is dependent upon or related to (in direct proportion) the performance of other discrete effort. Appportioned effort may be included (and budgeted) as part of the work package to which it relates, or it may be established as a separate work package with its own budget (which is based on a percentage of the related work packages). Appportioned effort may also be included (and budgeted) as part of the cost account to which it relates or it may be established as a separate cost account with its own budget (which is based on a percentage of the related cost account or work packages). It is important that the contractor have apportioned effort, and procedures for use of apportioned effort, well defined in his system description. From a practical standpoint, however, the intent of this criterion is that the contractor adequately identifies, justifies, and quantifies the relationship between the apportioned effort and the base effort to which it is related. If this relationship is not sufficient, that apportioned account may not be a valid collection point for the accumulation of actual costs. When establishing a time-phased budget and when measuring performance of apportioned effort the percentage factors of the base effort by which the apportioned effort is multiplied is directly dependent upon the quantified relationship between the base and apportioned accounts. For this reason, the factors established for the application of apportioned effort must be documented and applied in a formal, consistent manner. Apportioned effort should be restricted to only that which is genuinely related to discrete effort. The collection of the Actual Cost of Work Performed (ACWP) in an apportioned account,

however, is not dependent upon the same factored relationship established for the "time-phase budget" data and "earned value" data ACWP for the apportioned effort will be what ever is actually expended to accomplish the apportioned effort.

I7 Interpretation:

I agree with the write-up. This section really belongs under planning and budgeting.

CHECKLIST QUESTIONS:

- a. Is effort which is planned and controlled in direct relationship to cost accounts or work packages identified as "apportioned effort?"

IntGd Text

Apportioned effort is not measured by itself but in proportion to a related task. For example, the work of a quality assurance technician inspecting welded seams is in direct proportion to the work of the welder welding the seams. If the inspector's time is planned and controlled as 25% of the welders time (this factor must be substantiated by historical, engineered, or other acceptable standards) then the inspector's cost account and work packages are to be identified as apportioned effort. The two different efforts, welding and inspection, are directly proportionate to one another and the inspection effort is dependent upon the amount of welding effort. Therefore, the inspection effort should be planned, budgeted, time-phased, measured, and controlled based upon the plan and performance of the welding effort.

I7 Interpretation: O.K.

- b. Are methods used for applying apportioned effort costs to cost accounts applied consistently and documented in an established procedure?

IntGd Text

Apportioned effort has a time-phased budget in proportion to the discrete measured effort budget upon which it was based. Earned Value (i.e. the evaluation of work progress, also known as the Budgeted Cost of Work Performed, BCWP) for apportioned effort is taken in that same proportion. Once the proportionate relationship are established, they must be applied consistently. Procedures describing apportioned effort methodologies are to be formally prepared and followed. Of equal importance, however, is that there be procedures for the accumulation of actuals in the apportioned account. It must be clear that the ACWP values are not factored off of the base account like BCWP and BCWS are. Rather the ACWP accounting methodology should be similar to that used for all discrete effort and thus represent the actual resources expended in the accomplishment of the work.

I7 Interpretation: O.K.

6. IDENTIFY UNIT COSTS, EQUIVALENT UNIT COSTS, OR LOT COSTS AS APPLICABLE.

IntGd Text

Just as a contractor acquires materials, vended items, and subcontracted components by unit of cost so also is he expected to produce his contracted items in a manner that facilitates derivation of unit cost. Future pricing efforts are intimately concerned with the cost per unit of previous contract acquisitions. Current negotiation postures are established based upon historical unit costing as well. Such data helps provide the important justification for what is termed a "fair and reasonable" acquisition cost of items being procured by the Government.

Where production situations exist such that items are being produced an accelerated assembly-line basis, it may not be practical to determine individualized unit costs. In these instances, it is sufficient to accumulate "lot" costs (wherein a "lot" is an aggregate of a specified and consistent number of units).

There are yet other situations wherein units are being produced on a single production line for more than a single customer. In these situations units are taken off the line in more or less random order according to the delivery agreements of the different customer's contracts. It is difficult, therefore, to establish exactly what the cost was of the specific units that went into each customer's order. In such instances, it is sufficient to establish "equivalent unit costs." (i.e. all things being equal, on a "mature" production run, each unit's cost is approximately equivalent to every other unit's cost). Where learning curves are indicated equivalent unit costing must incorporate the value of the learning curve into each equivalent unit.

CHECKLIST QUESTIONS:

- a. Does the contractor's system provide unit costs, equivalent unit or lot costs in terms of labor, material, other direct, and indirect costs? (Describe procedure.)

IntGd Text

Just as the Planning and Budgeting criteria required the contractor to establish budgets by element of cost, so also is the contractor required, by the Accounting Criteria, to accumulate all actual costs incurred on a contract by element of cost. As contractors determine their unit, lot, or equivalent unit costs of the items they are producing, they must include with these costs their proportionate breakdown by element of cost. If a given unit's cost was determined to be \$35,000, it is important to know, for current negotiation postures and future acquisitions, how much of this cost was due to labor, how much was due to materials, how much was for other direct charges, and how much was due to overhead. The contractor's system must be able to identify the cost of products in these terms as a minimum.

I7 Interpretation: O.K.

- b. Does the contractor have procedures which permit identification of recurring or nonrecurring costs as necessary?

IntGd Text

Generally, recurring costs are those that would be incurred in continuing production of

the product. Non-recurring costs are those associated with such one-time tasks as design development, systems test and evaluation, initial plant layout, training or preparation of technical data and manuals to name a few. The contractor's accounting system must have procedures to provide for the identification of recurring and nonrecurring costs. If 50% of a unit's cost of \$100,000 was identified as nonrecurring costs then future negotiations and project acquisition plans could legitimately expect the unit cost in the future to be around \$50,000. So the identification of recurring and nonrecurring costs on a contract, and more specifically on a unit-cost basis, provides valuable data for estimating the cost of future activity for both the government and the contractor.

I7 Interpretation: O.K.

7. THE CONTRACTOR'S MATERIAL ACCOUNTING SYSTEM WILL PROVIDE FOR ACCURATE COST ACCUMULATION AND ASSIGNMENT OF COSTS TO COST ACCOUNTS IN A MANNER CONSISTENT WITH THE BUDGETS USING RECOGNIZED, ACCEPTABLE COSTING TECHNIQUES; DETERMINATION OF PRICE VARIANCES BY COMPARING PLANNED VERSUS ACTUAL COMMITMENTS, COST PERFORMANCE MEASUREMENT AT THE POINT IN TIME MOST SUITABLE FOR THE CATEGORY OF MATERIAL INVOLVED, BUT NO EARLIER THAN THE TIME OF ACTUAL RECEIPT OF MATERIAL; DETERMINATION OF COST VARIANCES ATTRIBUTABLE OF THE EXCESS USAGE OF MATERIAL, DETERMINATION OF UNIT OR LOT COSTS WHEN APPLICABLE, AND FULL ACCOUNTABILITY FOR ALL MATERIAL PURCHASED FOR THE CONTRACT INCLUDING THE RESIDUAL INVENTORY.

IntGd Text

Recognizing the vast number of differences that can exist between contractors' materials accounting systems (especially the point at which materials are accounted for) this criterion intent is to establish those characteristics that, as a minimum all material accounting systems should be able to adhere to. Regardless of whether contractors account for materials at the point of consumption (on an "applied" basis) or at some material control point (on an "other-than-applied" basis) these accounting parameters/restrictions must be met.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

- a. Does the contractor's system provide for accurate cost accumulation and assignment to cost accounts in a manner consistent with the budgets using recognized acceptable costing techniques?

IntGd Text

Material costs must be accurately charged to cost accounts using recognized and accepted methods. These methods may vary based upon the way the material is brought into the cost accounts. For example, material received directly into work that is in-process would normally be costed at its invoice amount directly to the using cost account. Materials issued from an inventory storeroom/warehouse, on the other hand, may be costed to the using account in several different ways: (1) On a LIFO basis (Last In, First Out basis) in which the most recently received units of each type of material are issued first. In inflationary times this process allows the contractor to cost the higher priced materials (just received) to the contracts in-house while retaining the less inflated priced-units in his inventory as surplus or back-up commodities. (2) On a FIFO basis (First In, First Out basis) in which the first units received of each type of material are also the first units issued for usage. This method is most beneficial when there are large quantities of materials being used which have a short, specific shelf-life of guaranteed useability. (3) On an AUC basis (Average Unit Cost Basis) wherein the units being issued for use are taken from the warehouse in a random order with no regard to their time of receipt. An average cost of each unit of each type of material is maintained and updated as each new shipment of materials is received. Then when a unit of material is issued the using cost account will be charged with the average unit cost of that material.

Still other materials may be furnished by the customer, in this case the government (known as GFM-Government Furnished Materials), and would be costed at no charge when placed into work that is in-process. Regardless of the costing method used, however, the same basis must be used for both budgeting and applying actual costs for materials. If material will be supplied as GFM and accounted for at no charge, then the contractor's plan should have reflected this in the material budgets of the affected cost accounts. If a LIFO material accountability system is used for warehoused materials, then the original cost account budgets should be estimated with this "Last In, First Out" concept in mind. The way materials are budgeted- for in cost accounts must be dependent upon the contractor's methodology for accounting for those materials.

I7 Interpretation: O.K.

- b. Are material costs reported within the same period in which BCWP is earned for that material?

IntGd Text

BCWP, Budget Cost of Work Performed, is the term used for evaluating contractor progress. If a job is estimated to cost \$100,000 and halfway through the contractual period of performance the contractor has actually spent \$50,000, one only knows that the contractor has spent half of the money he had planned to spend. One does not know exactly how much work was planned to have been done by the halfway point, and one does not know how much work was actually done by this point in time. Let's assume the plan was to be done with 40% of the contractual work by the halfway point. The performance measurement data for this effort is as follows.

- a. BAC, Budget at Completion = 100,000.
- b. BCWS, Budgeted Cost of Work Scheduled = 40% of the work = \$40,000.
- c. ACWP, Actual cost of Work Performed = \$50,000.

d. BCWP, Budgeted Cost of Work Performed = the "budgeted" value of the work that has been done so far = ?

We can see from the above data that contractor has overspent his planned budget by \$10,000, but we still don't know how much work has been done (the BCWP value). In order for BCWP to have any meaning at all, care must be given to ensure that the contractor does not take credit for work being done (BCWP) before that work is charged to the cost account. If BCWP values are generated in different months than which ACWP is accumulated for cost accounts the performance, or progress, determinations will be distorted. In the above example, if BCWP is \$25,000 then in comparison to the plan (BCWS) the contractor has only done 25% of the work instead of the 40% he had planned. What is worse, it has cost him 50% of the total budget to do that 25% of work. The determination of "earned value" or BCWP is all-important and the crux of any performance measurement system. For it to have any value at all, BCWP for each increment of effort must be claimed in the same period as which its actual cost are charged to the cost account.

In the case of material usage, the same is true. The easiest method to ensure that both costs (ACWP) and earned value (BCWP) occur in the same accounting period is to use the same document to trigger both data items. For example: (1) for materials measured at the point of receipt, the receiving report triggers both earned value and applied cost. (2) For materials measured at the point of issue from a material-holding account, the issue document triggers both BCWP and the transfer of cost (ACWP) from the inventory to the cost account.

I7 Interpretation: O.K.

c. Does the contractor's system provide for determination of price variances by comparing planned versus actual commitments?

IntGd Text

Materials cost variances (that is the difference between the budgeted and actual costs of the work performed ($BCWP - ACWP = CV$) can be divided into two sources or causes: price variance and usage variance. Usage variance is discussed under a forthcoming JIG Checklist Question. Price variance is the difference between the budgeted cost for the bill of materials (based upon engineering drawings and technical orders, etc.), including planned quantities for testing and scrap, and the price paid for the bill of materials. By formula:

$$P.V. = (\text{Budgeted price} - \text{Actual price}) \times (\text{Actual quantity}).$$

The price variance can be determined early in the contract when the materials are ordered and can be used in projections of the estimate cost at completion. The price variance is of prime importance to those responsible for ordering material. Thus the contractor's material accounting system must be able to quantify the material cost variance into its respective causes, price and usage variance; and his system must adequately determine price variance by comparing the planned commitments to the actual commitments.

I7 Interpretation: O.K.

d. Is cost performance measurement at the point in time most suitable for

the category of material involved, but no earlier than the time of actual receipt of material?

IntGd.Text

Performance measurement for material is measured like any other element of cost. The material budget must be time-phased by dollar amount and to the period in time when the earned value (BCWP) is expected to be claimed and the actual costs (ACWP) recorded in the performance measurement system. Earned value (BCWP) for material may be claimed at the point-in-time after its receipt which is most suitable to the contractor. The most meaningful points are at the time when the material enters work-in-process, when the material is withdrawn from inventory, or when it is "laid up" in preparation for release. The contractor must have, and follow, procedures to develop material performance measurement. The optimum performance measurement for material is to lay out a time-phased budget based upon anticipated material usage, claim "earned value" when the material is used, and apply the costs of material at the same time the material "earned value" is claimed.

I7 Interpretation: O.K.

- e. Does the contractor's system provide for the determination of cost variances attributable to the excess usage of material?

IntGd.Text

As we mentioned earlier, material cost variances can be divided into two sources or causes: price variances and usage variances. Price variances have already been discussed under a previous question of this last accounting criterion. Unlike a price variance which can be determined early in the contract when the materials are ordered, usage variance can occur throughout the period of performance. Normally, usage variances are the resultant cost of materials used over and above the quantity called-for in the bill of materials. Certainly, however, there are instances where less material than anticipated in the bill of materials is used. So a usage variance is simply the cost of materials usage that is different than the anticipated (budgeted) material usage. By formula it is represented as follows:

$$U.V = (\text{Budgeted Quantity} - \text{Actual Quantity}) \times (\text{Budgeted Price})$$

So while the price variance is of prime importance to those responsible for ordering material, the usage variance is of prime concern to those responsible for controlling the quantity of materials used. Planning for material usage allowances to cover scrap, test rejections, unanticipated test quantities, and the like, is a practical necessity and the contractor should have records of such provisions. The more uncertain the expected usage, the more important it is to have a good plan and to keep track of performance against it (particularly for contract-peculiar materials or materials which require long procurement lead times). Analyzing and determining current and projected usage variances can provide important, continuing internal measurement.

I7 Interpretation: O.K.

- f. Does the contractor's system provide unit or lot costs when applicable?

IntGd Text

A previous accounting criterion required the contractor to identify unit costs, equivalent unit costs, or lot costs when applicable by element of cost (labor, material, ODC, indirect). The above criterion question, requires the contractor's material accounting system to provide unit or lot costs when applicable. The difference between these two standards is subtle. The first one requires that each unit produced should be broken down by element of cost so that each unit's own production cost can be determined. The second standard has to do not with the end product's unit cost, but with the accounting system for materials for each unit. The contractor's accounting system for the accumulation of materials used and charged to each contract, should be able to identify the number of units of each type of material that went into each unit on a given contract. The above criterion standard, in other words, goes a little deeper than the previous one. Instead of just requiring the identification of that part of the unit cost which was due to materials, this standard requires a tabulation identification capability of the contractor's accounting system, to tell which materials were used in each item produced, and how many units of each type of material was used per end item.

I7 Interpretation: O.K.

g. Are records maintained to show full accountability for all material purchased for the contract, including the residual inventory?

IntGd Text

Records must be kept to provide for full and complete accountability of all materials purchased for the contract or furnished as CFM (government furnished materials). These records must reflect the acquisition, issue to cost accounts, return of unused material from cost accounts, scrap quantity and disposition, residual material inventory. Normally, any unused material should be returned to stores/warehouse for disposition. Actual direct material costs include the materials in the final product, scrap, damaged materials, and so forth, plus any material purchased for the contract but not used, for which an alternate use cannot be found. However, unit cost projections for follow-on procurements should include material consumed plus material requirements for schedule assurance based on waste and spoilage trends determined from an appropriate phase of the contract performance. Without full material accountability requirements unit cost projections would not be dependable.

I7 Interpretation:

I agree with the write-up. This really belongs in the property accounting area of government oversight, not in the C/SCSC implementation check list.

IV. ANALYSIS CRITERIA

1. IDENTIFY AT THE COST ACCOUNT LEVEL ON A MONTHLY BASIS USING DATA FROM, OR RECONCILABLE WITH, THE ACCOUNTING SYSTEM; BCWS AND BCWP; BCWP AND APPLIED (ACTUAL WHERE APPROPRIATE) DIRECT FOR THE SAME WORK; VARIANCES RESULTING FROM THE ABOVE COMPARISONS CLASSIFIED IN TERMS OF LABOR, MATERIAL, OR OTHER APPROPRIATE ELEMENTS, TOGETHER WITH THE REASONS FOR THE SIGNIFICANT VARIANCES.

IntGd Text

The intent of this criterion has several facets. First is to establish the fact that analysis, to remain viable, must be accomplished on a regular periodic basis. Since most contractor's accounting and budgeting systems are established on a monthly basis, analysis should be accomplished on this same periodic interval.

Secondly it is the intent of this criterion to establish the fact that analysis efforts must begin, as a minimum, at the cost account level. Since the cost account is the lowest level where full management and control responsibility exists for specific WBS increments of work, the cost account is the logical point for not only the planning, scheduling, budgeting and accounting efforts but also for the analysis effort as well. A Cost Account Manager would not have full management and control responsibility if his span of authority did not include the requirement to analyze the work performance and associated costs against the Performance Measurement Baseline. And since the cost account represents the lowest level of the CWBS and OBS, by virtue of this requirement for analysis to begin at this level, summarization of analytical data and trends can be validly accomplished.

Another intent of the criterion is to make it perfectly clear that all data to be analyzed must come directly from, or be reconcilable with, the accounting system. This represents yet one more effort on the part of the criteria to ensure that completely comparable data is analyzed; this minimizes the amount of distortion that would otherwise be rampant if data from a "second set of books" were used for comparison/analysis purposes.

Lastly, this criterion establishes the minimum content of any cost account analysis effort. It implies that the following data elements must be identified, on a monthly basis, at the cost account level: BCWS, which represents the amount of work planned each month; BCWP, which represents the amount of work actually accomplished each month as well as the budgeted value of that work progress; and ACWP, which represents the actual cost of the work accomplished each month. Given these three data elements, this criterion requires that two comparisons be made with them: BCWS versus BCWP, and BCWP versus ACWP. These comparisons result in two variances. BCWP minus BCWS results in the cost account's Schedule Variance expressed in budgetary terms. BCWP minus ACWP results in the cost account's Schedule Variance expressed in budgetary terms. BCWS minus ACWP results in the cost account's Cost Variance expressed in dollars relative to the Budget. Since budgets and actuals are required by previous criteria to be established/ accumulated by element of cost, the above data elements, comparisons, and variances can (and should) also be identified by those same elements of

cost. Lastly, where variances (schedule or cost) exist, the Cost Account manager is required by this criterion to identify the reasons for those which are significant. (The significance of a variance is usually established by its relative size in comparison to a variance threshold or tolerance band.)

G4 Interpretation:

CONCUR WITH THE INTENT, HOWEVER, I HAVE PROBLEMS WITH THE INTERPRETATION OF "SIGNIFICANT" AND THE USE OF "THRESHOLDS". We at [this command], have tried to get away from a significant variance being determined by some "magical" established threshold based on a dollar value or percentage, or a combination of both. From a Program Manager's point of view, we have tried to make CPR data meaningful and useful. Rather than citing thresholds for Variance Analysis (VA) and requiring VA Reports (VARs) for all areas that exceed thresholds, we encourage each PM to discuss with his contractor counterpart (1) What areas of the effort, using the WBS, should be emphasized for analysis, i.e. Hull construction vice Program Mgt., (2) How do we define and agree on what is "significant" ^ 1 (3) How do we communicate to each other the problem, corrective action, who is working to the problem, and the impact. Once these agreements are reached, we find that both the PM and the contractor converse on the program using performance management as the basis for their concerns and take ownership in the C/S system.

From a contractor point of view, we encourage discussion of problems between cost account managers and their functional supervisors at meetings rather than requiring CAMs to write VAs. We would rather have Supervisor/CAM discussions and have a supervisor who sees the total picture write one VA on the problem. What VA goes into a CPR is not the CAMs VA report verbatim, but the Supervisor's interpretation of the problem, impact, and solution. We find this makes the CAM feel he is part of a useful process rather than just a part of a large "business as usual" system. Additionally, this practice cuts down on a substantial amount of paperwork and allows each CAM and supervisor to be more productive.

In summary, what we have tried to do is to get everyone involved in the performance management system. We want to make performance management a working everyday tool, not a documentation nightmare that nobody uses. We are attempting to put a stop to the practice of misinterpreting C/S guidance to force a CAM to keep a book of VA reports, based on some threshold, that he opens only when a Govt. review team is in plant. Finally, we encourage meetings involving CAMs, Supervisors and Navy personnel where issues are discussed and resolved.

G5 Interpretation:

This criterion is one of the most difficult to interpret meaningfully in the Shipbuilding industry. Specifically, Material variance analysis produces the challenge.

COST VARIANCE (INCLUDES COMMITMENT VARIANCE ANALYSIS):

Because over half of the material procured by the Contractor for ship construction falls into the Long Lead and/or restricted vendor category, conventional monthly variance analysis requirements do not provide optimum results. These Major Equipment purchases each entail a Purchase order contract which sets the scene for early identification of Variance at Completion. This severely limits the added value of revisiting the incremental realization of these variances as the Actual Costs are compared to monthly progress values. The lack of meaningful

additional variance information in these situations, has produced a frustrating requirement for Cost Account Managers. They are confronted with explaining and re-explaining variances, month after month, when the cause and value of these variances was known from the beginning. It is not unusual for as much as three years to pass between ordering this type of material and the ship sailaway, when variance requirements are relaxed. Even raw materials pose a similar problem. Many of these types of material are procured using a Services type contract which sets out a unit price for all like items bought within a given time frame. This means that only issue variances can be the driver of additional variances that emerge. (This discussion assumes that Progress is taken at Point of Payment, and no later). Because of these prevailing conditions, we have administered this criterion with a bit more flexibility as it pertains to Material performance measurement. Although we have required policy statements that stipulate monthly analysis where thresholds are exceeded, this area is not subject to frequent verification. We continue to monitor Reporting Level Analysis of cost variances. Because we have been unable to convince our Washington Program Management office to modify the CPR requirements for variance analysis (we have suggested a Laundry list approach that would only require update if conditions change), we will continue to administer the requirement in this manner.

SCHEDULE VARIANCE:

Analysis of current period schedule variance has also proven frustrating in a system where progress is taken at point of payment. Cases where early payments are made to obtain discount are not always predictable. This condition provokes a favorable current period variance in one period which is fast followed by unfavorable current period performance when the schedule catches up. Analyzing this type of variance causes a form of punishment for early payment in that it provokes extra analysis work. This really sends a confusing signal to our contractors. As with repetitive, meaningless cost variance analysis, this area is rarely audited, if ever. This is essentially avoiding enforcement of reporting requirement (CPR) that we cannot change. Often the CPR reflects variance analysis that is done by the CPR preparers vs. the Cost Account Managers in these cases.

I1 Interpretation:

Comment: Basically O.K. as written.

For the sake of clarity, consider modifying last sentence to read as follows: "The significance of a variance is usually established by its relative size in comparison to a threshold "stated in terms of either absolute dollars and/or percentage of BCWS for current period, cum-to-date, at-completion, as specified in the Contractors System Description or Program Directive."

Threshold values are usually established and/or subsequently modified by the Contractor with full disclosure to and/or concurrence by the customer prior to implementation.

I4 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up except that the analysis may be in terms of hours or other standard measurement units at the cost account level. It must be able to be rolled up and dollarized at the CPR reporting level.

CHECKLIST QUESTIONS:

- a. Does the contractor's system include procedures for measuring performance of the organization responsible for the cost account? (Provide typical example).

IntGd Text

Each cost account has responsibility of a single organizational element of the contractor's management structure. Performance measurement data (BCWS, BCWP, and ACWP) must be collected at the cost account level by the Cost Account Manager for the organization of which that manager is a part. Performance measurement data, by element of cost, is usable to identify trends in the cost, schedule, and technical performance of the cost account staff. To be effective this data must be produced with regularity (monthly) as a normal part of the management process. This process, like all other parts of the Contractor's management system, should be documented in formal operating procedures.

G4 Interpretation: O.K.

I1 Interpretation:

Comments: Delete the last ten words of the second sentence, i.e., "for the organization of which that manager is a part." A Cost Account Manager of a "Integrated Product Development Team" (IPDT) normally belongs to an organization that is the most critical to the success of that team. However, the Cost Account Manager is responsible for the overall cost account and as such "takes the BCWP", analyzes any significant variances, and prepares the EAC/LRE for the total team effort across all organizations participating on the IPDT.

I4 Interpretation:

Current interpretation is dated. The emphasis is on the structure and the manager implies a rigid matrix organization. Those companies using team organizations may have team responsibility and not have an individual manager responsible. The portion on data is correct. Whether the company is team organized or matrix organized the responsible organization must have the data to make decisions.

I7 Interpretation: O.K.

- b. Does the contractor's system include procedures for measuring the performance of critical subcontractors?

IntGd Text

"Critical subcontractors" are so-defined because of their total dollar value and/or their technical risk to the prime contract. It is normally required that the prime contractor flow-down the C/SCSC requirement to critical subcontractors and to develop detailed measurement techniques for statusing their cost, schedule, and technical performance. This flow-down of C/SCSC to critical subcontractors should be a unilateral decision, it should be mutually agreed to by the prime contractor and the government. For those

cases when subcontractors are required to comply with C/SCSC requirements, the prime contractor must establish and follow procedures to ensure the applicable subcontractors implement the C/SCSC in a timely and accountable fashion. In those cases where C/SCSC is not flowed-down to a subcontractor, it is necessary to evaluate subcontractor performance. Formal procedures should include the establishment of subcontractor reporting requirements as well as the validation, review, and evaluation of the subcontractor's performance measurement data by the prime contractor.

G4 Interpretation: O.K.

I1 Interpretation:

Question & Comment: Should the word "not" be inserted into the second sentence so that it would then read, "This flowdown of C/SCSC to critical subcontractors should NOT be a unilateral decision, it should be mutually agreed to by the prime contractor and the government." Next to the last sentence, add the following words to the end of that sentence, "at least to monitor schedule performance." (On Firm Fixed Price contracts there should be no cost risks, by definition, however, there may be technical or schedule risks).

I4 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up except that flow-down of C/SCSC requirements is not necessarily required but subject to the same guidelines as the imposition of the criteria on the prime contractor.

- c. Is cost and schedule performance measurement done in a consistent, systematic manner?

IntGd Text

Performance measurement data is most useful when consistent measurements are made in a systematic manner. This provides comparable data from one period to the next for the evaluation of performance trends. For consistency of data it is necessary for the measurement techniques to be documented in formal operating procedures and for the contractor's personnel to be trained in the use of these procedures. Documentation and training helps to ensure that the "earned value" methods for evaluating work progress will not change even if personnel assignments are changed during the performance of the contract. Without formal training and procedural documentation of measurement techniques, a performance measurement becomes a subjective decision, or guess, on a month-to-month application. When this is allowed to happen, there exists the possibility of the cost account manager hiding potential problems by overstating the amount of work accomplished. Performance measurement should be based on discrete events and predetermined, objective, measurement techniques applied on a consistent basis, rather than on subjective evaluations that change from one period to the next.

G4 Interpretation: O.K.

I1 Interpretation: O.K.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

d. Are the actual costs used for variance analysis reconcilable with data from the accounting system?

IntGd Text

A cost variance is computed by subcontracting ACWP from BCWP. The actual costs come from the accounting system and must reconcile to the accounting records. This must be true at any level of summarization from the cost budget level to the total contract level. If the actual costs reflected in the ACWP data and used for cost variance calculation do not reconcile back to the accounting system's accumulation of real charges, the cost variance, of course loses its credibility.

G4 Interpretation: O.K.

I1 Interpretation:

Comment: Basically O.K. as written.

It seems to me that most major DoD contractors today utilize Cost/Schedule Systems that utilize "ACTUALS" taken from the accounting system Data Base and therefore seldom, if ever, require reconciliation. This checklist item was perhaps more applicable 25 years ago when C/SCSC was first introduced.

Exception: See Checklist Question IV.6.a.(1) re: Material Commitments. C/SCSC Criteria requires "actuals" for ACWP to be defined as of time of expenditure whereas many contractor project accounting systems include material commitments as of time initially requisitioned or "the purchase order" is placed with parts or service vendor.

I4 Interpretation:

Current interpretation is good. It might be well to explain that the accounting records may need to be adjusting due to timing issues. That these adjustments called "estimated actuals" need to be formally documented to ensure good earned value measurement.

I7 Interpretation: O.K.

e. Is budgeted cost of work performed calculated in a manner consistent with the way work is planned? (For example, if work is planned on a measured basis, is budgeted cost for work performed calculated on a measured basis using the same rates and values?)

IntGd.Text

The intent of this question is to ensure that the contractor uses the same method for calculating both BCWS and BCWP data. Throughout the Planning and Budgeting Criteria much emphasis is put on the planning of resources needed to accomplish each work task. It is often erroneously assumed that the resultant resource plan, spread over time is what constitutes the monthly BCWS values and the Performance Measurement Baseline. Instead, monthly BCWS values should be derived by an objective method commensurate with the way BCWP values are derived so that comparisons between BCWS and BCWP have a minimum amount of distortion. The objective methods used to calculate BCWS AND BCWP should be chosen so that when BCWS is calculated it matches the monthly resources plan as closely as possible. The method used should depend also, upon the type of effort involved in each work package.

Discrete effort work packages contain effort that has specific measurable tasks and which are planned, ideally, to be accomplished over short periods of time. Where these work packages must be of longer duration, discretely measurable, intermediate milestones should be used to measure performance/progress. A primary objective of C/SCSC is to maximize the amount of discrete measurement. There are several "earned value" techniques which can be used for measuring the performance of discrete tasks which are in process at the time when BCWS and BCWP must be calculated. Among these are:

- a. 50-50 Method
- b. 0-100 Method
- c. Interim Milestone Method
- d. Percent Complete Method
- e. Equivalent Units Method
- f. Supervisors Estimate Method

Many variations off of these methods also are possible as long as the method the contractor intends to use to calculate BCWP is the same method he uses to generate his BCWS values. Apportioned effort work packages are those which bear an intrinsic relationship to another "base" work package which is discretely measured. The method for calculating BCWP and BCWS for apportioned effort is called the "Factored Method," and the BCWP and BCWS values of the apportioned work are calculated as a factor (or percentage) of the BCWS/BCWP values of the base package.

Level of Effort tasks are those which are not discretely measurable nor "factorable" to another discrete work package. There is no methodology available for measuring the in-process value or the progress of Level of Effort tasks; they are only measurable with the passage of time (rather than by some type of milestone accomplishment). BCWS values are normally the same values as the resource plan for these tasks and BCWP values are automatically assumed to equal the BCWS values with each incremental passage of time. Hence BCWP equals BCWS and Schedule Variance is always zero for LOE tasks.

Regardless of the type of effort involved or the method chosen by which to measure "earned value," BCWS must be calculated by the same method. It is not allowable, for example, to plan work by a "factoring" method if "earned value" is to be calculated by one of the discrete measurement methods. Nor is it allowable to plan work by the Interim Milestone method if "earned" is to be calculated by the 50-50 method. Absolute

consistency is mandatory between the planning method used and the "earned value" method chosen for measuring performance. They must be the same.

G4 Interpretation: O.K.

I1 Interpretation:

The first paragraph of the "Interpretative Guide" is confusing and not understood. The concept seems backwards in the explanation. I believe it should be revised as follows:

- leave the first two sentences as written,
- delete the third and fourth sentence,
- modify the fifth sentence to read, "The objective methods used to calculate BCWS and BCWP should be chosen so that when BCWP is calculated it matches the method selected for BCWS/BCWP at the time the Cost Account Schedule was prepared so that they are truly comparable and consistent."
- leave last sentence as written.

In sum, the BCWS is the Baseline and there should not be a need to calculate or to modify that number at the time the "earned value" is taken. Rather, at that point, the system should be simply input with the value of the BCWP earned for that period in a manner consistent with the Work In Process Measurement (WIPM) technique originally selected (and calendarized in the BCWS).

The remaining four paragraphs are, for the most part, satisfactory as written, although I do not believe the Work In Process Measurement (WIPM) technique, #(vi.), "Supervisors Estimate Method", is recognized as one of the more common techniques, as is the case with the others listed. As a matter of fact, this was the first time I had seen or heard of it. Suggest this "method" be deleted from the example.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

- f. Does the contractor have variance analysis procedures and a demonstrated capability for identifying (at the cost account and other appropriate levels) cost and schedule variances resulting from the system (provide examples) which-

I1 Interpretation:

This is one of the most important check-list questions whose interpretation drastically needs updating to include a discussion of the contractors efforts to streamline existing System Descriptions to accommodate Summary Level VAR preparation in lieu of a blanket mandate requiring written variance analysis for all (or all active) Cost Accounts.

The May 1991 "Joint Government and Industry Report for Program Management on Cost/Schedule Management Process" showed the greatest need for improvement in the analysis, trends, and reporting category is in the area of VARIANCE ANALYSIS. "Reasons of

dissatisfaction (both government and industry) pointed to excessively detailed requirements, repetitive narratives and voluminous paper work."

"The June 1992 DoD Team Chief meeting verified that variance analysis reports, written at the cost account level, a feature of most contractor systems (as of 1992), are not required by policy. They are, rather, a product of unwritten implementation rules (and perhaps perpetuated via training classes and related materials such as the "Interpretative Guide"). Additional conclusions were that significant costs can be avoided and system effectiveness greatly improved by insuring that contractor variance analysis is a function of the way the contractor manages the work."

"How this is achieved must be determined on a case-by-case basis by first understanding the contractor's management process and then exercising judgment to determine if the system/system description and procedures are criteria compliant." Reference: National Security Industry Association(NSIA) White Paper: Summary Level Variance Analysis, dated 26 February 1993, recapping the results of the 1992 C/SCSC National Workshop "Track 5" and the related OSD presentation on proposed changes to the DSMC Program Management Cost/Schedule Management curriculum which called for "a three fold increase in the weighted value on analysis. The central theme was to allow contractors flexibility toward increasing quality as long as the criteria is met."

"The definition of summary level variance analysis is an analysis that includes more than one cost account which is documented and includes identification of the problems, impacts, and corrective actions for those cost accounts with significant variances." "The grouping of cost accounts for summary level analysis normally should be derived from the contractor's management approach, taking into account the WBS and/or function and customer (e.g. CPR) reporting requirements. The documenting of the summary level variance analysis internally is flexible but must be accomplished in a formal manner and become part of, or an option within, the contractor's validated PMS system."

- (1) Identify and isolate problems causing favorable and unfavorable cost and schedule variances?

IntGd Text

The measurement of performance and comparison of performance data with both budgets and actual costs has as its main purpose the identification of individual tasks and areas of responsibility that are deviating significantly from the plan. The contractor's system for analysis of variances should concentrate on those cost accounts and higher level summaries where significant variances exist. Written procedures must require formal variance analysis for those variances from the "plan" that exceeds established cost and schedule variance thresholds at the cost account and other appropriate levels. Thresholds should be established at several levels since it is also possible for small variances that exist at the cost account level to have a significant effect on higher level CWBS/OBS elements, contract milestones, cost goals, or technical parameters. Significant variances at the higher levels must also be isolated and analyzed.

G4 Interpretation: O.K.

I1 Interpretation:

Many, if not most, computer programs utilized by DoD contractors for Cost/Schedule management today generate the C/SCSC variances at all levels of the CWBS/OWBS as well as display the "explanation required thresholds" in terms of absolute dollars or percentage.

The "Interpretative Guide" for this check-list item should be rewritten to reflect the emphasis on utilizing the "summary level analysis" approach defined above and discussed more completely in the referenced White Paper. Note that this proposed approach does NOT change the level of granularity for planning, budgeting, taking value earned, or collecting actual costs.

It also does NOT propose changing the calculation and display of the Cost/Schedule Variances at the Cost Account or any higher levels. It does change the approach from requiring formal written variance analysis always by the Cost Account Manager for every Cost Account. It does NOT relieve the Cost Account Manager from the responsibility to understand his/her performance and to be answerable for any and all variances for "their" assigned Cost Accounts.

I4 Interpretation:

Current interpretation is dated. Since that was written, the approach that has been emphasized is that the analysis should be done for management purposes and not as a required writing exercise. There is consensus that cost account written analysis is not required. The current interpretation deviates from that with the words, "Written procedures must require formal variance analysis....at the cost account..." Probably the least value added statement in the current interpretation is that there should be thresholds established at several levels. The rewritten interpretation should stress the requirement to have the ability to identify root causes for the numerical variances, when those variances are identified by the joint government-contractor management system as being significant.

I7 Interpretation: O.K.

(2) Evaluate the impact of schedule changes, work-around, etc.?

IntGd Text

The contractors managerial staff must also be sensitive to the effects of changes in schedules in order to evaluate the cost-impact of these changes. Changes in schedules, work-around plans, and corrective action plans affect the cost plan (time-phased budget) and, most often, the final cost. The relationship between schedule changes and the performance situation must be reflected in the monthly data developed by and for each responsible manager. This data should be reflected in cost account level analysis and "estimates at completion as well as estimations of when significant schedule variances will return to "zero."

G4 Interpretation: O.K.

I1 Interpretation: O.K.

Comment: See (1) immediately above.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

(3) Evaluate the performance of operating organizations?

IntGd Text

Cost accounts are identified to higher level OBS elements responsible for their scopes of work. Within these responsible organizations, performing units can experience various degrees of efficiency and performance progress. The contractor's management system must be capable of isolating these performance deviations. This data provides some of the most useful information to the cost account manager when tasks within his area of cost account responsibility are performed by more than one performing unit, and when these tasks continue over long periods of time. Isolating variances to performing organizations allows the corrective actions to be specific and to be channeled toward the neutralization and correction of the work methods, tools, and underlying conditions which caused the problems.

G4 Interpretation: O.K.

I1 Interpretation:

The existing words in the "Interpretative Guide" were written in the context of the classical "matrix organization" of "functional organizations" performing for "a Program Office".

It was written prior to the era of Integrated Product Development Teams (IPDT), Concurrent Engineering, etc., as defined in the PMJEG JIG Supplemental Guidance #4. That document establishes the approach that Format 2 of the monthly CPR can utilize a WBS reflecting IPDTs in lieu of the OWBS structure (Format 2 when modified for IPDT is sometimes referred to as Format 2A). It also permits the utilization of that "modified" WBS in the preparation of Format 4, (in terms of equivalent manmonths).

Note that the PMJEG has replaced the term "Performing Organization" and "Functional Organization" with the term "Responsible Organization" throughout the JIG (by Supplemental Guidance #4 and #6).

I4 Interpretation:

Current interpretation is unimportant. The use of C/SCS data as a method for contractors to measure their operating organizations performance is not likely as long as C/SCS is applied on a contract by contract basis and contains the current value limiting inflexibilities and over emphasis on details that make it inefficient.

I7 Interpretation: O.K.

(4) Identify potential or actual overruns and underruns?

IntGd Text

Another primary purpose of C/SCSC is the identification of the most likely final cost of

the project. The measurement of performance and its comparison to the "Contract Budget Base" has as its main purpose the identification of variances that may cause contract overruns or underruns. Performance deviations that create potential "at-completion" variances must be recognized and analyzed by the manager responsible for the WBS/OBS element involved. The use of predictive methods for extending current performance to completion is highly recommended. Additional factors that are not reflected in current performance should also be taken into account by the cost account manager. These include such factors as: the probable assignment of less-experienced workers in the task due to personnel shortages, occurrences of problems on similar tasks contained in other cost accounts, and schedule delays anticipated for the future. These potential overruns/underruns at the cost account levels are summarized through the CWBS and OBS to determine potential higher level overruns/underruns. Higher level management must review these summarizations of performance and analyze their underlying causes. It is possible that the manager at the cost account level may not be aware of all the project conditions that may effect his cost accounts.

G4 Interpretation: O.K.

I1 Interpretation:

Comment: See (1) immediately above in this section.

I4 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up. However, the purpose of the C/SCSC is to establish a standard and basic framework for reporting performance to the government, not in identification of costs, schedule variances and the like. It is the validated system which must actually do the data accumulation and reporting. The criteria's role is the establishment of a framework within which those systems must operate.

2. IDENTIFY ON A MONTHLY BASIS, IN THE DETAIL NEEDED BY MANAGEMENT FOR EFFECTIVE CONTROL, BUDGETED INDIRECT COSTS, ACTUAL INDIRECT COSTS, AND VARIANCES, ALONG WITH THE REASONS. (Reference format 7).

IntGd Text

Just as a performance measurement is needed for all directly costed effort on a contract, so also it is important to measure the progress of all overhead efforts attributable to the contractor's business base. Unfortunately, since overhead effort is not attribute-able to a single contract it is almost impossible to measure the progress of overhead tasks on a contract-by-contract basis. Any performance measurement of overhead tasks must be done on a total facility basis. But while this is important in the contractor's efforts to control overhead cost growth it does not make for very good monthly identification of overhead progress. As a result, the criteria only requires a minimum of monthly overhead analysis: that of comparing overhead budgets to overhead actuals (with the stipulation that any resultant variance be explained as to its cause). It is because of the assumptions on which this minimal analysis effort is based that many have claimed that

"Overhead defies performance measurement." To be sure, the criteria standards for overhead analysis are relatively lax in comparison to the direct effort. However, this in no way should be construed to mean that the contractor is relieved of his responsibility to manage overhead costs and control (minimize) the growth of overhead costs on a facility-wide basis. The acknowledged difficulty in analyzing overhead performance only makes it more paramount for contractors to exercise maximum discipline over their overhead procedures.

G4 Interpretation: O.K.

I1 Interpretation:

The Contractor Program Manager(CPM) is accountable for the total contract costs, schedule and technical performance on his/her contract. Total cost performance includes both direct costs charged as well as the indirect cost applied to the direct costs (or hours) charged to the Program/Contract.

While the direct costs budgeted and incurred on any contract is more directly under the control of the CPM than the indirect costs applied, the CPM performance is measured on total costs and therefore part of the Program Managers task is to contain total cost performance by use of a Management Reserve or by working to achieve direct cost underruns to offset any indirect cost overruns, if necessary.

The existing "Interpretative Guide" correctly states that "any performance measurement of overhead tasks must be done on a total facility basis." Seldom would the manager of a program also have control over a "total facility". Rather, several contracts are normally being performed within a facility. Accordingly, it is in the interest of the CPM to routinely monitor the performance of indirect costs applied to his/her project compared to what was bid, negotiated and budgeted.

All Cost Account (and Summary Level) Managers on the contract that have indirect costs applied to their direct costs(or hours) should be aware of the source of any indirect cost overruns in terms of "rate" vs. "usage". These managers typically have some degree of control over "direct labor rate of personnel utilized" and/or "usage" of the number of hours those personnel utilize in performing the assigned tasks. If the "usage" of budgeted labor costs (or hours) are exceeded them they are accountable for those "over-runs" and responsible for a "corrective action plan" to accommodate the "excess direct charges" as well as the "indirect costs" applied to the "direct cost over-run". Individually, the Cost Account Managers have much less control over "indirect rate increases" although they may be required by the Program/Contract to also find away to "offset" such over-runs through "work-arounds" or other efficiencies that will help offset such a problem.

The CPM addresses any "indirect rate" problems with the General Management of the facility who will address corrective action within the context of the Joint Implementation Guide, Chapter 3, Criteria Discussion, paragraph 3-2.c.(8), and 3-4.d. "Indirect Costs." Aside from the CPM's responsibility to "control" his/her total program costs and to insist that Cost Account and Summary Level managers on the contract focus on the "usage" variance, the Contractor Program Manager is motivated by the nature of his/her responsibility for Contract Performance to actively address any "indirect rate" problems with the General Management or selected functional management staffs (wherever the prime control lies).

In summary, I believe the "Interpretative Guide" needs a rewrite for the Check-list Question IV.(2) to separately discuss the Earned Value Program Management System part of the criteria as the primary responsibility of the Contractor Program Manager. This discussion should be segregated from the broader "facility general management" system that addresses analysis and corrective action to reduce over-head or other indirect costs via departmental/pool budget analysis and/or questions dealing with increasing rates due to diminishing anticipated new business base from multiple customers/contracts. As presently written, "the contractor (collectively) "must have the capability to identify the cause of each overhead cost variance as either due to a usage variance, a change in business volume, or a rate variance due to a change in the direct base" (last sentence of Checklist Question interpretation IV.(2). b.).

Traditionally, DCAA has addressed "pool costs", "business base" and the "rates" derived for "indirect application." Why not cross-reference these issues to DCAA as done in Chapter 3, of the JIG as referenced above. For purposes of the "Interpretative Guide" and training course for C/SCSC Earned Value, it would be less "diluting" if the discussion focused more on direct management of the program (contract) and direct the other less CPM controllable aspects to the existing government regulations already in place for all DoD contracts, including those with or without the additional requirements of C/SCSC or C/SSR requirements.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

- a. Are variances between budgeted and actual indirect costs identified and analyzed at the level of assigned responsibility for their control (indirect pool, department, etc.)?

IntGd Text

There are two facets to this question. First is that, as a minimum, the contractor's procedures must require that budgeted indirect costs be compared to actual indirect costs. The variances that result from such comparisons must be identified and summarized from their management control point up through the OBS and CWBS to the total contract level. Accompanying these variances must be analyses of their causes and necessary corrective actions.

The second facet of this question is the requirement that the contractor's procedures for overhead control acknowledge that the management level where this analysis must start is the same management personnel which have the responsibility and authority for overhead control (identified in compliance with the Planning and Budgeting Criteria). The criteria does not attempt to standardize the level where overhead must be planned, budgeted, authorized and controlled. But it does require the contractor to at least identify where these activities must be managed and to align the responsibility for this management with the authority to manage, analyze, and control overhead (as is deemed necessary).

G4 Interpretation: O.K.

I1 Interpretation:

Comment: See Comments IV.2. above.

I4 Interpretation:

Current interpretation is unimportant. The use of C/SCS data as a method for contractors to measure their operating organizations performance is not likely as long as C/SCS is applied on a contract by contract basis and contains the current value limiting inflexibilities and over emphasis on details that make it inefficient.

I7 Interpretation: O.K.

- b. Does the contractor's cost control system provide for capability to identify the existence and causes of cost variances resulting from--
 - (1) Incurrence of actual indirect costs in excess of budgets by elements of expense?
 - (2) Changes in the direct base to which overhead costs are allocated?

IntGd Text

In order to have adequate control of indirect expenses, the contractor's overhead control system should be capable of identifying overhead budgets and collecting overhead costs by element of expense for each using department. This systems should be able to accommodate summarization of both budgets and actual costs functionally (by department and/or by incurring organization) and by individual collection pool as well. Any incurrence of actual indirect costs in excess of budgets can thus be subdivided by element of expense. If overhead costs cannot be budgeted and collected in a consistent and disciplined manner, and if responsibility does not exist at the point where the costs are actually being incurred, little can be done to analyze indirect cost variances and even less can be done to initiate corrective action.

In addition to overhead services being over-subscribed to and thereby causing costs variances, overhead expenses can also be thrown drastically out of control by a change in the direct base to which the overhead costs are allocated. Company-wide indirect budgets are generally established based on potential business in a forecasted time frame. This business base forecast is typically time-phased to show the anticipated increases and decreases in the business volume. Where there is a drastic change in the business volume the contractor may choose to change the direct base by which his overhead costs are prorated in order to better spread his overhead costs across the contracts that made up the total business base. Such a change in the direct base can itself cause a cost variance to occur. The contractor must have the capability to identify the cause of each overhead cost variance as either due to a usage variance, a change in business volume, or a rate variance due to a change in the direct base.

G4 Interpretation: O.K.

I1 Interpretation:

Comment: See Comments IV.2. above.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

c. Are management actions taken to reduce indirect costs when there are significant adverse variances?

IntGd Text

Since overhead costs, to a degree, do defy performance measurement, this requirement for management action in response to significant overhead variances becomes the crux of overhead control. Many contractor's have no valid procedures for defining when an overhead variance becomes "significant". This being the case, most overhead variances (with the exception of those caused by drastic changes in the business base) never get identified as "significant". Overhead, then, takes on the specter of being uncontrollable. Nothing could be further from the intent of the criteria. Specific variance thresholds should be established for the various overhead categories to define when they are significant (out of tolerance). During the monthly review of the contractors performance measurement data, variances caused by actual indirect costs exceeding their budgets should be analyzed by the responsible overhead manager. "Significant" variances and unfavorable trends should be thoroughly investigated and corrective action planned as required. "Estimates at completion" should then be reviewed/revised in light of these significant manifestations.

G4 Interpretation: O.K.

I1 Interpretation:

Comments: See Comments IV.2. above. Also, I do not believe negative remarks such as [the following]:

"Since overhead costs, to a degree, do defy performance measurement, this requirement for management action in response to significant overhead variances becomes the crux of overhead control. . . . Overhead, then, takes on the specter of being uncontrollable." These comments do not seem to serve the purpose of the "Interpretative Guide" in a positive way and should be deleted.

Likewise, the specific solutions as stated in the "Interpretative Guide" may be an acceptable approach for some contractor, some where, but is certainly far from a generic solution as implied, i.e., "Specific variance thresholds should be established . . . During the monthly review of the contractor's performance measurement data, variances caused by actual indirect costs exceeding their budgets should be analyzed by the responsible overhead manager."

It seems to me, that the "Interpretative Guide" ,in this area, should do no more than emphasize that an "acceptable" formalized budget/control procedure must be effectively utilized to control indirect costs to the satisfaction of DCAA. The present write-up co-mingles two major areas of

management responsibility, the specific program performance review, with the facility indirect cost control performance review. From a practical operational standpoint should they be discussed separately. Additionally, to co-mingle the discussions adds to the confusion and does not help the reader of the "Interpretative Guide."

I4 Interpretation:

The interpretation misses the mark for many contractors. Overhead control using LOE methodology generates acceptable performance measurement data. Variances to plan on overhead should result in demonstrable corrective action by the contractor. However there is no criteria requirement for a threshold to identify significant internal overhead variances. There is a threshold to identify variances reported in the CPR in the contract that needs to be emphasized.

I7 Interpretation: O.K.

3. **SUMMARIZE THE DATA ELEMENTS AND ASSOCIATED VARIANCES LISTED IN ITEMS 1 AND 2 ABOVE THROUGH THE CONTRACTOR ORGANIZATION AND WBS TO THE REPORTING LEVEL SPECIFIED IN THE CONTRACT. (Reference formats 2, 3, 4, and 5.)**

IntGd Text

The intent of this criterion is to ensure that the data being used by the contractor's managerial staff is the same data that is reported to the government. Since the CWBS and OBS exist as a formal and disciplined framework for work and responsibility definition they become the ideal vehicles for summarization of data from the cost account level to the government reporting level. Using the CWBS and OBS for summarization purposes ensures that data on all work elements and organizational elements is included in the reporting data base. An additional benefit of this requirement for CWBS and OBS Summarization is that it helps to identify the significant problem areas from among all levels of the contractor's organization and the contract scope of work. When significant variances exist in the monthly data report, it is possible to track down through the CWBS and OBS to identify the causal factors involved in that variance. This auditability allows analysis of corrective action procedures and impact evaluation, both of which are important in decision-making at the Program Office level.

G4 Interpretation: O.K.

G5 Interpretation:

This is another area where it is difficult to effectively interpret as it applies to Material Performance indicators. We have a functional roll for materials at a very high level in the contract and this is mainly driven by point of progress decisions.

The functional breakdown, under the system currently in use, is based on Procurement specialty areas. The perception has been that this is the primary point of control. This approach is in the process of being evaluated for change. In the interim, three broad categories of functional material breakdown are used. The primary shortcoming of this approach is that the only true prospect for avoiding a cost or schedule variance is vested in the buyer. They bear the whole

burden for obtaining a price and delivery schedule that meets the value and schedule set out in the contract. This point has been selected as the functional intersection because the buyer is the last person who controls the ACWP potential (thereby the BCWP). This is being reviewed with an eye towards making the Designers and Installers of material more involved in CAM functions. To do this effectively, we may need to change when we record progress, most likely to point of issue. This gives control of the material to the installer, however it has a negative cash flow aspect that could be financially painful until the payment cycles "caught up". Designer involvement would logically consist of a more preventive type of cost or schedule analysis, which could later be used to justify an "unavoidable" variance (such as preferred or cheaper material not available or not available in time).

We have recognized that the current functional roll of material through the OBS provides insufficient segregation of information to be useful. Because of this we concentrate on the CWBS summarizations, keeping in mind the limited recovery inherent in this approach. We are several years away from an ability to prevent Cost/Schedule variances attributable to expensive or time-consuming design choices.

I1 Interpretation:

Basically satisfactory as written, however, suggest change the second word of the last sentence from "auditability" to "traceability".

I4 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up. Don't forget to incorporate the concept of the integrated product or work team when discussing roll up through WBS and or OBS

CHECKLIST QUESTIONS:

- a. Are data elements (BCWS, BCWP, and ACWP) progressively summarized from the detail level to the contract level through the CWBS? (Provide exhibit.)

IntGd Text

The CWBS is a product-oriented family-tree division of hardware, software, services, and other work tasks. Each successively lower CWBS level is a subset of the element above it. By ensuring a level-by-level summarization capability, data can be collected for analysis at varying levels of the CWBS which facilitate visibility as to where the problems lie. The cost accounts, as the lowest level juncture between the CWBS and OBS required by the criteria, represent the lower level where actual costs must be collected and performance measured. All the data elements (BCWS, BCWP, and ACWP) plus the ancillary data derivable from them, such as BAC, Schedule Variance (SV), Cost Variance (CV), Estimate at Completion (EAC), and Variance at Completion (VAC), are calculated at the cost account level. These data must summarize from the cost account level up through the CWBS to the total contract level without being divided among two or more higher level CWBS elements. Reconciliation of certain of these summarized data elements to the Contract Budget Base helps to ensure absolute budget integrity. And the

summarization process itself, ensures an ability to audit the origin of any and all problems. It also provides assurance that both contractor and the government are using the same data-base to manage the contract/program.

G4 Interpretation: O.K.

I1 Interpretation: O.K.

I4 Interpretation:

Current interpretation is marginal. There may be work tasks and hardware that do feed up to two higher level WBS elements. The interpretation needs to allow this with the requirement that when this happens, the process needs to be documented. For example there may be a common part number that is used in two legs of the WBS. For many contractor's it would be impractical to split out this effort into two separate parts. Also for the government it would not be cost effective to do so. There are design work tasks that are similar. For example the mechanical engineers may be looking at the coating required on the contract's parts to make them "stealthy". This is not associated with just one leg of the WBS. The contractor's system may assign it to one leg or if significant may allocate the BCWS, BCWP and ACWP to all the legs. However this is accomplished, it should be acceptable and documented.

I7 Interpretation:

I agree with the write-up. Don't forget to incorporate the concept of the integrated product or work team.

b. Are data elements summarized through the functional organizational structure for progressively higher levels of management?

IntGd.Text

This question is identical to the foregoing one except that it asks if the data summarization is conducted functionally through the OBS instead of through the CWBS. All of the parameters and benefits of the CWBS summarization also accrue to an OBS summarization. Neither summarization is sufficient by itself, however, because each alone could give a distorted picture of what the true performance and problem areas are. Analyzing a CWBS data summarization alone will allow the extrapolation of the performance of the main cost drivers of the contract and will highlight what the problem areas are to date. Analyzing an OBS summarization will add another dimension to the total analysis, however. It may point out, for example, that what was originally thought to be a series of unrelated hardware problems is, in reality, a design problem which is exhibiting cost and schedule variances in the engineering function. Without the dual summarization of data, and the auditability it provides, data analysis can be easily distorted and misread.

G4 Interpretation: O.K.

I1 Interpretation:

The Check-list word "functional" needs to be changed to "responsible" in accord with PMJEG Supplemental Guidance #4 to the current JIG. Interpretation is otherwise satisfactory as

written.

I4 Interpretation:

Current interpretation is good. It should be noted that the issue identified above is not a concern in the OBS because generally tasks are associated with a single organization.

I7 Interpretation:

I agree with the write-up. Don't forget to incorporate the concept of the integrated product or work team

- c. Are data elements reconcilable between internal summary reports and reports forwarded to the Government?

IntGd Text

In "fixed-price type" contracts, where the performance and cost risk is almost entirely on the contractor, the need performance data reporting is drastically minimized. In "cost type" contracts, the government shares a great deal of the performance and cost risk with the contractor and must make continued program tradeoffs between cost and technical parameters. Both contractor and the government have an important role in the management of programs that are contracted on a "cost-type" basis. The contractor must manage day-to-day development and production problems while the government has to manage the dollarized-acquisition process of the needed weapon system. Primary in this mutual management effort accurate and adequate communication. The data reports are the prime vehicle for this communication. But to ensure the validity of these reports and hence facilitate the communication process it is paramount that both the contractor and the government be using the same data. The internal and external report formats need not be identical. But their data base must be one and the same. Any difference in the data on a contractor's internal report versus what he reports externally to the government can have severe repercussions on the contract itself, not to mention the truth-and-understanding relationship between the two parties.

G4 Interpretation: O.K.

I1 Interpretation: O.K.

I4 Interpretation: O.K.

I7 Interpretation:

I do not agree with the write-up. Whether the contract is a fixed price or a cost plus contract should make no difference in the reliability and integrity of the data. In all cases where the contractor is required to provide management data, that data must be reconcilable between internal management reports and reports forwarded to the government.

- d. Are procedures for variance analysis documented and consistently applied at the cost account level and selected WBS and organizational levels at least monthly as a routine task?

IntGrd Text

The requirement for variance analysis includes the need for contractor management to acknowledge the problems, identify the causes, evaluate the impact, and develop corrective action and work-around plans. The contractor must have written procedures requiring such monthly variance analysis to occur at the cost account level and at higher levels in both the CWBS and the OBS. This variance analysis must be performed and fully documented whenever schedule, cost, or at-completion variances exceed predetermined thresholds. (Normally the specific dollar or percentage thresholds are not specified directly in the analysis system description/operating procedures because they must vary based upon the type, size, and risk associated with each individual contract. But the requirement for such thresholds should exist in the procedures and the actual thresholds should be attached or referenced as an appendix/addendum to these procedures). The consistent application of variance analysis procedures is paramount to all cost account managers doing their job of management. If it does not occur here (at the cost accounts) as a minimum, any variance analysis occurring at a higher organizational level risks gross misemphasis, misinterpretation, and inadequate corrective action.

I1 Interpretation:

To enable contractors to "streamline" their System Descriptions and processes as described above in the Interpretation of Checklist question IV.1.f. and allow the option of Summary VARS, the words "analysis" in check-list item IV.3.d. needs to be replaced by "reporting."

The existing interpretation needs to be rewritten so that variance reporting is maintained as a requirement for sake of visibility in performing any analysis required. However, formal written analysis of all variances (above a threshold) at the Cost Account level should not be mandated but rather the option of suitable Summary VARS at the customer reporting level or as otherwise selected under an approved System Description and/or Program Directive (within the rules of the compliant System Description).

I4 Interpretation:

Current interpretation is dated. Since that was written, the approach that has been emphasized is that the analysis should be done for management purposes and not as a required writing exercise. There is consensus that cost account written analysis is not required. The current interpretation deviates from that with the words, "This variance analysis must be performed and fully documented..." The rewritten interpretation should stress the requirement to have lower management (CAMs) do variance analysis and communicate it to higher level management. The communication methodology does not necessarily require the formal written variance analysis, but does require full disclosure of the amount of the problem, the cause of the problem, the effect of the problem, the corrective action required, who will do the corrective action and when they will be done.

I7 Interpretation: O.K.

4. IDENTIFY ON A MONTHLY BASIS SIGNIFICANT DIFFERENCES BETWEEN PLANNED AND ACTUAL SCHEDULE ACCOMPLISHMENT TOGETHER WITH THE REASONS.

IntGd Text

Because a comparison of BCWS to BCWP provides a dollarized schedule variance determination it is often misassumed that this is the extent of schedule management and analysis required by the criteria. To be sure, such a schedule variance is extremely important to any performance measurement system. But it cannot stand alone. What can it mean, for example when a contractor has a negative schedule variance of \$1.5 million? How far behind schedule has the contractor actually slipped? Is this schedule slippage retrievable? How much time does this \$1.5 million represent? And more importantly, as a summary-level schedule variance, what is the schedule status of the work packages of the underlying WBS and OBS elements? The intent of this criterion is to ensure duplicity in schedule management and analysis. Schedules must be managed by the work they represent as well as by the cost by which they are depicted in a BCWS or BCWP data element. Reasons for schedule variances must address work tasks in order for corrective action to be relevant. The dollarization of a schedule variance is simply a means of addressing the impact, in dollars, of a schedule variance. It does not address the time factor of the work discrepancy. This criterion ensures that this time factor is not overlooked.

G4 Interpretation: O.K.

I1 Interpretation: O.K.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

- a. Does the scheduling system identify in a timely manner the status of work?

IntGd Text

Much emphasis is placed by the Planning and Budgeting Criteria on the need for scheduling systems to sequence the authorized work, identify task interdependencies, and identify interim milestones for work statusing. From an analysis standpoint, it is important to have assurance that the scheduling system does in fact, identify work status in a timely manner. From the master schedule down through the intermediate level schedules to the cost account and work packages schedules, the scheduling system must portray the planned work by period of time, the actual accomplishment of work, and deviations from the planned schedule. Schedule data must be timely to provide managers with information needed to identify problem areas and take corrective actions.

G4 Interpretation: O.K.

I1 Interpretation: O.K.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

b. Does the contractor use objective results, design reviews and tests to trace schedule performance? (Provide examples.)

IntGd Text

Schedules at all levels must include the planned start and stop dates for tangible events such as flow diagram and drawing completion, procurements, construction, start-up, and acceptance/performance tests. Throughout work on the program, the progress is measured by the completion of these and other milestones. The contractor should use the results of these assessments to form the basis for measuring actual schedule accomplishment and tracking schedule performance. This standard further serves to emphasize the intent of the criteria to urge contractors to maximize their use of discrete definitions of effort in lieu of level-of-effort definitions which stifle schedule performance measurement.

G4 Interpretation: O.K.

I1 Interpretation: O.K.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

5. IDENTIFY MANAGERIAL ACTIONS TAKEN AS A RESULT OF CRITERIA ITEMS 1 THROUGH 4 ABOVE.

IntGd Text

The criteria, as a discipline, places many requirements on contractor personnel (particularly cost account managers) that literally, keeps them busy all the time. Often these managers get so busy going through the motions of performance measurement that they forget whey they are going through the motions. The intent of this criteria is to ensure that after the contractor managers have analyzed the performance measurement data (in accordance with the four foregoing criteria) they then take the necessary management action. This management activity should be identified, documented, followed-up for effectiveness, and reported to the government (where significant variances are involved).

G4 Interpretation: O.K.

G5 Interpretation:

Comments on IV, [criterion] 3 relate.

I1 Interpretation: O.K.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

- a. Are accurate cost and schedule performance measurement and analysis provided to the contractor's managers in a timely and usable manner?

IntGd.Text

Data from the contractor's management control system must be provided to managers for their use in tracking process, identifying problem areas and taking corrective action. The data must be received by the managers within a reasonable time (a length of time that will vary from manager to manager but which is sufficient to allow for effective response). And at the same time this data must be accurate (so the managers will have confidence that the data portrays true status) and should be in an easily understood format reflecting the tasks they are managing. When data are not timely, accurate, and/or usable, managers will be frustrated and will shun the data. Conscientious managers will develop their own "desk drawer" data systems as a result and they will drop their support of the contractor's performance/management system which they feel does not help them manage their tasks.

G4 Interpretation: O.K.

I1 Interpretation: O.K.

I4 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up. This write-up hits right at the core of ownership of the data and the use of the system. It cannot be stressed enough.

- b. Is the information in "a" above being used by the contractor's managers to identify reasons for significant variances and to initiate appropriate corrective actions? (Provide examples.)

IntGd.Text

Data from the contractor's management control system should be used by managers at all levels to status performance of their respective areas of responsibility. Where

performance does not meet the plan, variances will occur. Variances exceeding the predetermined thresholds should be analyzed by management to determine their cause and impact on the program. Corrective action or "get-well" plans should be developed and implemented to bring the program back on track. Unless managers use the performance measurement data to track their performance, identify significant variances from the plan, and take action to correct the problem areas, the data have not served their intended purpose.

G4 Interpretation: O.K.

I1 Interpretation: O.K.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

c. Are there procedures for monitoring action items and corrective actions to the point of resolution and are these procedures being followed?

IntGd Text

After significant variances have been identified and corrective action plans developed and implemented, the corrective actions have to be tracked until the problems are resolved and the program is brought back on track. Managers responsible for implementing the corrective action should periodically report their progress to higher level management until the problem has been satisfactorily resolved. When the action item can be formally closed. The contractor must have, and follow, procedures for monitoring corrective action plans from their inception until they are closed-out. Corrective action plans reflect the existence of a variance considered significant by management. They must be monitored closely and given additional management visibility and attention until resolved so as to not further jeopardize the success of the program.

G4 Interpretation: O.K.

I1 Interpretation: O.K.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

6. BASED ON PERFORMANCE TO DATE, ON COMMITMENT VALUES FOR MATERIAL, AND ON ESTIMATES OF FUTURE CONDITIONS, DEVELOP REVISED ESTIMATES OF COST AT COMPLETION FOR WBS ELEMENTS IDENTIFIED IN THE CONTRACT AND COMPARE THESE WITH THE CONTRACT BUDGET BASE AND THE LATEST STATEMENT OF FUNDS REQUIREMENTS REPORT TO THE GOVERNMENT. (Reference formats 2, 3, 4, 5, 10, and 11.)

IntGd Text

The Estimate at Completion (EAC) or as it is known to others, the Latest Revised Estimate (LRE), is the contractor's vehicle for telling the government where each CWBS element, OBS element, and the total contract is going with respect to cost. At the beginning of a contract the EAC is usually equal in value to the Budget at Completion (BAC) and these values are usually less than the Negotiated Contract Cost (NCC) and Contract Budget Base (CBB). At this point in time optimism normally prevails. As a contract progresses, problems arise which have to be reacted-to and neutralized. As these problems cause "significant" variances, the responsible manager must assess the impact of the problem. The most commonly used way of assessing impact is to develop a revised EAC. If for example a cost account had a BAC and EAC of \$500,000 prior to the occurrence of a significant variance, and the EAC was revised to \$600,000 as a result of this problem, the cost account manager is telling you that the impact of that problem is \$100,000 of additional expenses expected to be incurred to get back on track. With all managers using EACs to forecast impact on their problems the EAC becomes a barometer to the Government Program Manager by which he can make program decisions before the problem blows out of control. The intent of this criteria is to ensure they be constructed properly and that they can be compared to the amount of work authorized and the latest estimates of funds requirements reported to the government.

G4 Interpretation: O.K.

G5 Interpretation:

We have had a problem in the area of EAC rates for Overhead, off and on for many years. We have persistently maintained that the Contractor should be using the SAME rates to dollarize EACs as they use to dollarize Government Authorized Changes to the Contract. The Navy New Construction Contracts all are covered by a Forward Pricing Rate Agreement which is a negotiated MOA. These agreements typically cover a 5 year window, and are re-negotiated whenever changes in direct volume, overhead pool values or the Treasury rates change (this has worked out to be at least an annual process, with some rate re-negotiation occurring as frequently as quarterly when conditions merit).

We have had varying degrees of success with our insistence that the contractor use the same rates for EACs and Change, with some periods showing the rates used identical, and others as much as \$2.00/hour off. The contractor DOES consider all the factors described in IV.6.b, but does not apply them consistently for all pricing purposes within a given timeframe. The contractor is just as adamant that they are justified in using lower rates for EAC's than change, however, to close a SAR Discrepancy they have agreed that the rates will be very close. This must be monitored closely, or it is not honored.

We also employ some flexibility in our application of Material ETC development, permitting a consideration of the offset for sales of residual materials. This can cause negative estimate-to-complete on very mature ships, but can be substantiated by actual residual liquidation statistics.

I1 Interpretation:

Comments: satisfactory as written if modified as follows:

Revise third sentence, i.e., "At this point in time optimism normally prevails." While this may often be a true statement it is not as relevant as the fact that contractors most often "establish a

Management Reserve by authorizing Cost Account Budgets to the Cost Account Managers for values less than the cost proposed and negotiated with the government customer." This is the "real reason" that BAC and EAC at the beginning of the contract for the total contract is less than the Negotiated Contract Cost (NCC) and Contract Budget Base (CBB). This inherently gives most or all Cost Account Managers a "task to reduce costs below the bid and negotiated."

The Management Reserve is the only source the Contractor Program Manager has for "budget problems that are 'in-scope' to the contract but 'out-of-scope' to the Cost Account Manager such as unanticipated additional testing of critical components" (there must be some better examples which do not readily spring to my mind). Also, unanticipated increases to indirect rates may require application of Management Reserve to maximize control within the contractual budget and minimize the need to request the customer approval of an Over-Target-Budget (OTB) Baseline.

The sentence that "at this point in time optimism normally prevails" misses the mark and in fact may not be true. In any case, it should be deleted. Further, it seems to me that this is an appropriate place in the "Interpretative Guide" to give recognition to the realistic importance of the Management Reserve directly to the Program Manager of the Contractor and indirectly to both customer and contractor in maintaining a smoothly functioning management control process.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

a. Are estimates of costs at completion based on-

(1) Performance to date and material commitment?

I1 Interpretation:

MATERIAL COMMITMENT: An explanation of why inclusion of "material commitment" is important should be described in the "Interpretative Guide". I would explain that the "material commitments" needs to be known by the Cost Account Manager (and Summary Level Manager) preparing (or reviewing) an Estimate-To-Complete.

In any case, knowing the items and value of material ordered or requisitioned but "not received or paid for" should increase the accuracy of "the estimate-to-complete" by avoiding omissions or double counting that might otherwise occur. This is particularly important if the "contractors system" includes the estimated costs of requisitioned or ordered items in "actual costs reported" within the "Project Management Accounting System."

The contractors C/SCSC compliant system must of course reflect only "cost expended/paid values" in the ACWP in accord with the criteria. In summary, this means that the Cost Account Manager and other users of the project management and criteria compliant system of the contractor must both understand fully how the data reported to him/her is defined as well the significance of that data when preparing an Estimate-to-Complete or bottoms-up Estimate-At-

Completion.

For those system reviewers who are not familiar with this discussion, it will be helpful to explain why contractors often utilize project accounting systems that record actual costs to the end-item-account prior to expenditure/payment. Specifically, such systems are designed to report to the Cost Account Manager and other system users the total "Actual costs he/she has expended and committed" as of the report date so that they do not make additional commitments that would UNINTENTIONALLY exceed the total budget authorized for material "by signing additional requisitions" on that Cost Account.

PERFORMANCE TO DATE: The "interpretation" of this checklist question seems to be the most ideal place to introduce (or review) the importance of utilizing standard indices for Earned Value systems including, CPI, SPI, and TCPI, i.e., "Cost Performance Index", "Schedule Performance Index", and "To Complete Performance Index" when preparing or reviewing "Estimates-to-Complete" or "Estimates-At-Completion."

The Cost Account Manager (or Summary Level Manager) is expected to be able to explain any significant differences between the efficiency of Performance To Date when compared to Performance to Complete. Any formal Variance Analysis required to manage the job provides a logical opportunity to explain/document such differences.

(2) Actual costs to date?

I1 Interpretation:

First, please refer above to discussion of Material Commitment.

Second, based on the definition & content of "Actual costs to date", point out that the "cost-to-complete" must utilize the same definition/content so that when the two are added together the total is indeed equal to the expected "Estimate-At-Completion."

(3) Knowledgeable projections of future performance?

I1 Interpretation:

See "Interpretation Comments" in (1) immediately above.

The Cost Account Manager (or Summary Account Manager, if appropriate) is generally the most knowledgeable individual to project future performance in terms favorable or unfavorable circumstances and/or the nature of the job that will cause the performance to complete to be better than or worse than performance experienced to-date. In any case, it is at this point in the WBS hierarchy that accountability resides to provide and be prepared to explain the knowledgeable basis of performance and estimate.

Higher level WBS summary level managers have the responsibility, to review, understand and make evaluations/judgments on the creditability of forecasts and risks projected by the subordinate accounts within their assigned WBS summary point(s).

(4) Estimates of the cost for contract work remaining to be accomplished considering economic escalation?

IntGd Text

The intent of this question is to ensure that EACs be properly constructed. As a minimum, EAC must take into consideration the following factors:

- (a) Performance to date - this refers specifically to the Budgeted Cost of Work Performed (BCWP) calculation which should be a true indicator of work accomplished against the budgeted and scheduled plan for work accomplishment, the BCWS. BCWP should be based on the physical accomplishment of work. In calculating EACS, deviations from the planned progress (BCWP) minus BCWS) must be understood as to the cause of the variance. In addition, it must be known what effect the performance to date has on future performance.
- (b) Actual costs to date - this refers to the ACWP calculations and includes indirect costs, General and Administrative (G&A) expenses, and all allowable direct costs associated with labor, material and other direct charges.
- (c) Projections of future performance - EACs must be developed by those individuals knowledgeable of what it takes to complete the job. They need to know if there are additional tasks not originally planned for, if there are schedule delays that will slow down production, if future efficiency will match past efficiency, etc. This intimate knowledge of what the future working environment will be, can never be precisely known, but it must be included, nevertheless, as a calculated performance factor by which the work remaining must be multiplied.
- (d) Estimate of the cost of the work remaining - the most commonly used formula for work remaining is BAC-BCWP cum: As a minimum, the EAC must take "work remaining" into consideration. If economic escalation is anticipated this also should be calculated as a factor against which "work remaining" should be multiplied.

G4 Interpretation: O.K.

I1 Interpretation:

Last sentence of the existing interpretation (regarding economic escalation) is O.K. as written.

Many parts of the existing interpretation as written could be incorporated within the preceding sub-sections of (1), (2), (3) immediately above, which is recommended for ease on presentation and understanding.

A few of the existing sentences are vague and I believe tend more to confuse than to help the user of the "Interpretative Guide". Specifically, recommend deleting: "In calculating EACs, deviations from the planned progress (BCWP minus BCWS) must be understood as to the cause of the variance." [and] "This intimate knowledge of what the future working environment will be can never be precisely known, but it must be included as a calculated performance factor by which the work remaining must be multiplied;".

Please note that the existing interpretation discusses the "need to know if there are additional tasks not originally planned for,". However, it needs to be further noted that the added costs for these rightfully belong in the EAC only if they are within the "scope" of the Cost Account, as defined by the Work Authorizing Document (WAD) from the Contractor Program Manager or referenced customer statement of work within the WAD.

If there is true "additional scope" of added tasks that is to receive additional budget from the Contractor Program Manager, then they should be specifically excluded from the EAC of that

Cost Account until the additional budget is provided to the Cost Account.

The exclusion of these "added tasks" should be so noted by the Cost Account Manager via standard procedures of the Contractors compliant Management System. These "added tasks" may not only be "added scope" to the Cost Account but also "added scope" to the total contract tasks in which case the Contractor may pursue a request for additional scope from the customer.

In any case, to avoid distortion of the EAC, and it's comparison against BAC, the EAC must be for "the tasks budgeted" with exclusions noted for "additional scope" requested or as anticipated. Failure to follow this approach results in comparisons that are inconsistent and with the proverbial "apples being compared to oranges".

By combining sub-sections (1) through (4) of the interpretation in a consolidated narrative, the whole section is not only more difficult to read but also has some significant omissions, the most important of which is the discussion of Material Commitment. Please refer to my "Comments" and discussion of Material Commitments (above).

I4 Interpretation:

Current interpretation is marginal. The interpretation emphasizes schedule performance as a key to the EAC. The critical performance issue is cost performance to date not schedule. The issue on material commitments is to ensure the EAC includes known price increases on material and material overage that has already been ordered. The discussion on economic escalation misses the mark completely. The issue is did the EAC include knowledgeable projections of rate increases. The labor effort may be estimated accurately, but without applying an appropriate labor rate, the resultant cost estimate is not accurate.

I7 Interpretation: O.K.

- b. Are the overhead rates used to develop the contract cost estimate to complete based on:
 - (1) Historical experience?
 - (2) Contemplated management improvements?
 - (3) Projected economic escalation?
 - (4) The anticipated business volume?

IntGd Text

If the most currently available information on historic experience, management improvements, economic escalation, and changes in the business volume are not included in the contractors Estimate to Complete (ETC) on programs, the completion estimates can be grossly in error. The purpose of developing cost ETCs is to provide the contractor with information necessary to anticipate short-run and long-run funding requirements. Inaccurate projections of these short-run and long-run requirements can cause serious funding problems and the possibility of program terminations.

In developing ETCs the contractor is expected to use and to demonstrate the use of historical experience. For example, if history has shown that the contractor incurs

overhead factor rates significantly higher during year-end than during the first part of the year, this historical experience should be used to project the contract ETC. In addition, the contractor should anticipate the potential growth in the overhead factors toward the completion of a contract as the allowable labor and material base falls off and indirect remains relatively constant. EACs and ETCs should also consider contemplated management improvements if they were not part of the original plan. Such improvements as computer system enhancements and improved management techniques should be analyzed for both short and long-term effects on contracts. In the short-run, there may be an increase in the contract ETC based on investment costs, while in the long-run, management improvements may result in a decreased ETC.

As for economic escalation projections, normally, if the contractor prepares an annual "bottom-up" expense forecast as the basis for the annual overhead rate projection, escalation is already included in the base number. However, under current inflationary times, additional adjustments to these base numbers may be periodically required as a result of realized and projected economic escalation.

Lastly, it is imperative that the contractor use the latest information concerning realization or non-realization of potential business when calculating ETCs. Changes in the anticipated business base can have significant impact on the overhead rates and as a result, seriously influence contract ETCs.

G4 Interpretation: O.K.

I1 Interpretation:

Consolidation of the interpretation for this "overhead rate" set of questions (1) through (4) is agreed to be most appropriate in contrast to the prior checklist question, i.e. IV.6.(a), discussed immediately above. This is because these guidelines are applicable to all indirect rates applied to all DoD contracts (and perhaps general federal procurement regulations) subject to DCAA audit and requiring Disclosure Statements of accounting practice standards. They are not unique to C/SCSC or C/SSR requirements.

The first paragraph is NOT correct, as written. It would be acceptable if the second sentence if it is modified and an additional sentence is inserted prior to the last sentence, specifically suggest rewrite to say: "The purpose of developing cost ETCs is to provide the contractor with an established and acceptable means of managing the contract within the Contract Budget Baseline, schedule and technical performance requirements, and communicating to the customer the nature and the magnitude of any significant problems or risks that may be the cause of a projected overrun." In addition, ETCs provide the contractor with information necessary to anticipate short-run and long-run funding requirements."

Most if not all of the second through fourth paragraphs can and should be deleted. Note that as presently written, there is more "Interpretative Guidance" for this Checklist question IV. 6., that provides direction concerning "overhead ... to complete" than there is guidance on the contract Estimate At Completion". Because all DoD contracts (with or without C/SCSC or C/SSR requirements) are provided with many other sources of guidance on "developing, monitoring and controlling of indirect pools, bases, rates and business volume via DCAA Billing and Forward Pricing for audits of Proposals or pre-award surveys, it seems much more appropriate to cross-reference these sections to those compliance requirements that are generic to all or most DoD contracts, and expand the "Interpretative Guidance" only in those areas pertaining to the unique requirements of the Criteria (C/SCSC) or C/SSR "earned value."

I4 Interpretation: O.K.

I7 Interpretation: O.K.

- c. Are estimates of cost at completion generated with sufficient frequency to provide identification of future cost problems in time for possible corrective or preventive actions by both the contractor and the Government program manager?

IntGd Text

EACs must be generated often enough to allow management time to take corrective/preventative action. This requires that the Cost Account Managers review, on a monthly basis, their plans for continued validity. When CV and SV threshold are exceeded and written analysis are required, procedures should also require a written analysis of the EAC. In addition to these monthly EAC revisions, a more formal "grass roots" EAC should be calculated on an annual or semi-annual basis. A "grass roots" EAC is accomplished at the lowest level of detail that is practical to indicate what it's going to take to accomplish the remaining work. "Grass roots" EACs take considerable effort and are normally done in conjunction with some types of corporate budget/financial review.

G4 Interpretation: O.K.

I1 Interpretation:

Essentially satisfactory as written provided a minor modification of wording is included to recognize the use of written Summary Level Variance Analysis Reports as defined within the contractors compliant System Description. Specifically at the end of the third sentence, add "for each Cost Account or Summary Level as specified in the contractors compliant System Description and/or customer approved Program Directive."

I4 Interpretation:

Current interpretation is marginal. Grass root EACs should be done on scheduled basis (the criteria requires annually) to provide a working number. If there are indications of a problem, then an EAC should be done on the least effort basis (i.e., if engineering is a problem, only the Cost Accounts with engineering should be reforecast). For effective and efficient program management, the interpretation needs to point to the reality that forecasting is expensive, disruptive and that the result is really an estimate, not a fact. For example: on a five year contract the fourth and fifth years estimates have a high level of risk and will surely change, perhaps significantly as the work scope is better defined. Excessive contractor effort spent to update those outyear forecasts is not value added. This is particularly true when the real program management issue tends to be the near term funding, and the scope of the outyear efforts will be changed due to funding limitations anyway.

I7 Interpretation: O.K.

- d. Are estimates developed by program personnel coordinated with those responsible for overall plant management to determine whether required

resources will be available according to revised planning?

IntGd Text

EACs must be the result of a fully-staff and coordinated effort including top management involvement in order to ensure that needed resources (budget, manpower, special skills, etc.) are available. If resources are not available, replanning or work-around plans can be developed to accomplish the task within the limited resources or at a later time when the resources can be made available.

An EAC in excess of the budget is not an authorization to proceed in excess of budget until top management has reviewed and authorized its necessity.

G4 Interpretation: O.K.

I1 Interpretation: O.K.

I4 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up but does the second paragraph infer that a manager should stop performing a statement of work if he/she is in an overrun condition and the EAC reflecting that overrun has not yet been approved by management?

e. Are estimates of cost at completion generated by knowledgeable personnel for the following levels:

- (1) Cost accounts?
- (2) Major functional areas of contract effort?
- (3) Major subcontracts?
- (4) WBS elements contractually specified for reporting status to the government (lowest level only)?
- (5) Total Contract (all authorized work)?

IntGd Text

The Cost Account Manager (CAM) should be the one responsible for developing the Cost Account's EAC. The CAM may have people working for him that develop the detailed estimates of the work packages and planning packages, but like the CAMs, these people must have an intimate, "hands-on" knowledge of what is to be performed. Sometimes a financial analyst or planner is responsible for calculating EACs. This is acceptable if the EAC has been thoroughly reviewed and approved by the CAM.

Major functional areas of the contract are defined as subsets of the contractor's organization (including outside subcontractors who are to perform on the contract). For Engineering, for example, major functional areas might be Civil/Structural, Mechanical, Electrical, etc., with a manager for each of these functions who normally has one or more CAMs reporting to him. The exceptions are in a strict project organization with everyone reporting to the Project Manager. When variance analysis is required at the functional

level, procedures should require that a written analysis of the EAC be performed. Again, as with the cost account, an individual who is both responsible and knowledgeable of the work to be performed should develop the EAC.

A management team comprised of cost, technical, and contract administration skills usually developed to manage critical/major subcontractors. The EAC for these subcontractors could be the responsibility of any of these people but it should be fully staffed and coordinated with all cognizant parties within the contractor's organization. Often major subcontracts have C/SCSC (and appropriate reporting requirements) levied on them which require them to submit EACs generated at the appropriate levels of the CWBS and OBS.

Each level of the CWBS for which the Government requires performance measurement reporting, also, is required to have an EAC calculated for it. This EAC is usually the mechanical summation of the cost account's EAC at the respective lower levels of the CWBS. At the total contract level, the EAC must be the number that the contractor's program manager and top management personnel agree best indicates the most probable cost outcome. In that the sum CWBS (and OBS) EACs make up the total contract EAC, the EAC exercise becomes an iterative process with the CAM, Functional Managers, and the Program Manager to arrive at an agreed EAC. This iterative process is especially necessary for "grass-roots" EACs.

G4 Interpretation: O.K.

I1 Interpretation:

In the existing "Interpretative Guide," change the terminology from "functional areas" to "responsible areas" and "Functional Managers" to "Responsible Managers" in accord with the PMJEG Supplemental Guidance #6.

Otherwise, the existing interpretation is acceptable as written.

I4 Interpretation:

Current interpretation is marginal. The interpretation seems to be confusing in a couple of areas. The CAM has the responsibility to prepare an EAC. There should be a review process to ensure that the EAC is possible and reasonable. The responsible functional area comes into play to determine if the EAC is possible. The CAM may have an EAC that requires staffing that cannot be supported. The major functional manager should review and provide guidance to the CAM on the staffing limitations. In a similar manner, the program manager reviews the CAM EAC in terms of reasonableness and program goals. The intent of many PMs is to set CAM goals that are aggressive to lower the end cost on the contract. If the PM does set aggressive goals, it should be realized that although this will probably result in an unachievable EAC that must be judged upwards by the government to arrive at a final cost.

I7 Interpretation:

I agree with the write-up however, emphasis should be to insure that calculated EAC's are used only to validate the EAC generated by the cost account managers through knowledge and analysis of their performance.

Subcontractor EAC's should be reported in their performance reports, analyzed and verified by the prime contractor and the flowed into the prime contractor's reports. The verification may

include site visits and formal reviews of the documentation by the prime, with support of the government if appropriate.

- f. Are the latest revised estimates of costs at completion compared with the established budgets at appropriate levels and causes of variances identified?

IntGd Text

A comparison of EAC to BAC results in a Variance at Completion (VAC). The causes for VACs must be formally documented at the reporting levels of the contract. The analysis should include what underlying elements of work caused the deviation from the BAC, and what corrective actions, if any, are being implemented to minimize the cost overruns.

G4 Interpretation: O.K.

I1 Interpretation: O.K.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

- g. Are estimates of cost at completion generated in a rational, consistent manner? Are procedures established for appropriate aspects of generating estimates of cost at completion?

IntGd Text

In order to have confidence in the EAC, there should be well defined procedures that specify the EAC process. Detailed, written EAC guidance should address such EAC issues as:

- i. At what level of the CWBS and OBS an EAC is to be developed?
- ii. Who is to perform, review, and approve each EAC?
- iii. What the ground rules and assumptions are for each EAC cycle (e.g. "An EAC will be generated for all work scheduled to start in the next six months." Or 10% inflation is to be used for next years EAC...", etc.).

The internal and external audits of the EAC process determine whether or not the EACs are generated in a consistent manner as described in the written procedure. The EAC process must be well-understood by all parties responsible for their generation. This is the verification test of whether the written procedures are good: if they are well understood and applied consistently.

G4 Interpretation: O.K.

I1 Interpretation:

The first example under sub-section (iii) is at best a confusing example to have in this

"Interpretative Guide" and at worst, it may be totally incorrect in any case. It is suggested both examples be deleted from (iii) and leave the remainder of the interpretation, as written.

I4 Interpretation: O.K.

I7 Interpretation: O.K.

- h. Are estimates of costs at completion utilized in determining contract funding requirements and reporting them to the Government?

IntGd Text

The EAC should be compared to the time-phased funding requirements submitted to the Government via the Contract Funds Status Report (CFSR). The totals for the EAC and the funds requirements must reconcile. This appears to state the obvious, but the determination of funding requirements is often performed as a separate exercise from the EAC and by different people within the contractor's organization.

G4 Interpretation: O.K.

I1 Interpretation: O.K.

I4 Interpretation:

Current interpretation is good. There are issues of timing differences between the CPR and CFSR reporting of actuals and the question of fee inclusion in the CFSR and not in the CPR. Also cost sharing might be discussed, but all these might overcomplicate the interpretation.

I7 Interpretation: O.K.

- i. Are the contractor's estimates of costs at completion reconcilable with cost data reported to the Government?

IntGd Text

A contractor normally develops an EAC for their own internal management purposes and this EAC must be the same as is reported in the C/S reports going to the Government. During review/validation/surveillance of the contractor's performance measurement systems a check on the internal documentation of the EAC must be reconcilable to the latest EAC submitted to the Government.

G4 Interpretation: O.K.

I1 Interpretation: O.K.

I4 Interpretation:

Current interpretation is good. However the interpretation's first statement doesn't match the question above. The question asks if the contractor's estimate is reconcilable. The interpretation's first statement says that they must be the same.

I7 Interpretation: O.K.

V. REVISIONS AND ACCESS TO DATA

I2 Comments:

The tone and emphasis of this section [of the *Interpretive Guide*] is that of an auditor policing a contractor rather than strengthening communications and understandings. Suggest removing the one line statements of "what contractors do to avoid compliance". They are misleading, mostly wrong, and give a negative mood to the document. The JIG is a guide for the government but it's also a guide to Industry for the contractor to use in establishing a C/SCSC compliant system. This *Interpretive Guide* needs to communicate flexibility for the contractor to establish an effective system as well as limits for compliance with C/SCSC, so that review teams and contractors can better understand each other.

The following [comments of mine] are intended to provide information for balancing flexibility with limits.

- 1. INCORPORATE CONTRACTUAL CHANGES IN A TIMELY MANNER, RECORDING THE EFFECTS OF SUCH CHANGE IN BUDGETS AND SCHEDULES. IN THE DIRECTED EFFORT BEFORE NEGOTIATION OF A CHANGE, BASE SUCH REVISIONS ON THE AMOUNT ESTIMATED AND BUDGETED TO THE FUNCTIONAL ORGANIZATIONS.**

IntGd Text

This criterion mandates two major standards within the contractor's management/control system,. First, the contractor must incorporate scope of work, budget, and schedule changes initiated by the government within a timely period of time. This incorporation is intended to extend down to the cost account level of planning. Adherence to this standard helps ensure that budget and work remain co-assigned even when initiated by a contract change. In addition, it minimizes the length of time in which budget may remain classified as Undistributed Budget. It also ensures that the addition of budget and work by a contract change be time-phased as soon as practicable. It is imperative when a contract change is received that the contractor adhere to all the same requirements of planning, budgeting, and scheduling as he did when the original contract was planned, budgeted, and scheduled. This criterion seeks to establish this same requirement of thoroughness for contract changes as the Organization and Planning and Budgeting criteria did for the original contracted effort.

The second standard mandated by this criterion is that when an unpriced change order (here defined by the criterion as "directed effort before negotiation") is issued to the contractor by the government, the contractor should develop his "best estimate" of the cost of that change. This estimated budgetary account should be used in lieu of the budget that is normally associated with a negotiated and definitized change for planning and budgeting purposes. The intent here is to ensure that even in the case of unpriced change orders that a budgetary amount be assigned to each increment of work planned. No work should be held up because of the unnegotiated status of an "unpriced" change order, nor should such authorized but unnegotiated work be distributed for accomplishment without a budgetary target for performance measurement purposes.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

a. Are authorized changes being incorporated in a timely manner?

IntGd.Text

Three issues are covered by this question and the contractor's system description must address each one of them. First is the issue of what constitutes an authorized change. An authorized change may be the result of either of the following: (1) a contractual change, initiated by the government (including both "priced" and "unpriced" changes, engineering change proposals, supplemental agreements, and no-cost change directions), (2) formal reprogramming, requiring mutual agreement of both contracting parties and internal replanning by the contractor within the scope of specific budgetary parameters specified by the government.

The second issue deals with the concepts of "incorporation" of these types of authorized changes. Such changes shall be deemed "incorporated" when the planning (and its associated paperwork) is accomplished down to the cost account level. This therefore, includes the incorporation of all such changes into the "Performance Measurement Baseline" (or, in the case of reprogramming, the "Over Target Baseline," OTB). This also requires that the necessary changes be made to work authorizations, budget assignments, schedule parameters, and applicable technical (scope of work) documents.

The last issue is what constitutes a "timely" manner of incorporation? It is imperative that the length of time permissible for the full incorporation of all authorized changes be specifically stated in the contractor's system description. System reviewers must ensure that this "timely" incorporation is adhered to. As a rule-of-thumb, 30 to 60 days tend to be adequate for most contractual efforts. However, one must recognize the relative differential of difficulty involved in change incorporation between R&D programs and Production Programs. So while 30 days may be sufficient in a production environment, it may be too stringent in an R&D environment. In either case, the length of time allotted for change incorporation must be finitely identified.

It is also prudent to realize that the Joint Implementation Guide acknowledges a special dispensation in the case of unpriced change orders with respect to the enforcement of "timely" incorporation. In this situation, "the contractor may maintain budgets in an Undistributed Budget account until negotiations have been concluded, allocating budget only to that work which will start in the interim." However, if the contractor intends to invoke this license, his system description must include adequate procedures for doing so.

I2 Interpretation:

Second paragraph i.e., "deemed incorporated when planning is accomplished down to the cost account level." **Comment:** Add "or assigned to subcontracted effort which may be distributed to subcontractors or held in UB pending authorization/negotiations." In today's world, much of a prime contractor's effort is subcontracted which the JIG guidance fails to recognize adequately. The prime contractor needs the same flexibility for dealing with its subcontractors that the government exercises with the prime contractor.

Third paragraph i.e., "It is imperative that the length of time permissible for the full

incorporation of all authorized changes be specifically stated in the contractor's system description." Comment: Words of this nature are much too hard, and do not recognize the real job at hand. A contractor's system description should indicate the normal or typical period for incorporating major and minor changes. It's not realistic for all changes to always meet the designated periods. Unique situations can arise.

I7 Interpretation: O.K.

b. Are all affected work authorizations, budgeting, and scheduling documents amended to properly reflect the effects of authorized changes? (Provide examples.)

IntGd Text

All affected documentation impacted by any authorized change must be updated to reflect the proper and complete incorporation of that change. The contractor must maintain a formal, disciplined control system that facilitates traceability to the Contract Budget Baseline. This same system must also ensure that no work is performed without proper budgetary, schedule, and work authorization. To ensure that the authorized changes are fully staffed, formal communications documents such as internal change notices, revisions to cost account plans, updated drawings, etc. must be utilized as a "review" and approval process to ensure that everyone with a need-to-know has evaluated the impact and made the proper updates to incorporate the change.

I2 Interpretation: O.K.

I7 Interpretation: O.K.

c. Are internal budgets for authorized, but not priced changes based on the contractor's resource plan for accomplishing the work?

IntGd Text

All cost accounts must contain a budget, schedule, and scope of work and should realistically represent the manner in which work is assigned and budgeted to the organizational units. Further, the cost account budgets should include all direct costs for the sum total of their assigned work with separate identification of cost elements (labor, material, other direct costs). However, then it is clearly impractical to plan authorized work in cost accounts, budgets should be identified to effort at higher CWBS levels for further subdivision at the earliest opportunity. For authorized unpriced work, it is acceptable for the contractor to plan and budget near-term effort in cost accounts while the remaining effort and budget should be planned at a higher level. Such situations necessitate that a budget be formulated for distribution purposes in spite of the fact that this budget amount has not been formally negotiated between the contractor and the government. In these situations, where work is authorized before negotiations, appropriate change order planning will be accomplished and budgets will be established based on the contractor's cost estimate for the change. If need be, the contractor may allocate estimated budget for the immediate, near- term work requirement while maintaining the remainder of the budget-estimate in an Undistributed Budget Account (even if doing so would violate the normal length of time UB may exist for a negotiated

change). The contractor should not be required to use existing Management Reserve to provide funds for authorized, but unpriced, change orders. (The contractor may, if the documented management system permits, use Management Reserve to provide temporary budgets for such "unpriced" effort, but it must remain clear to both parties that the MR budget was derived from the funding previously negotiated for the contractual effort authorized prior to the change in process). After negotiation, the remaining effort will be planned and budgeted within cost accounts as soon as practicable to ensure disciplined baseline planning. The intention of this criterion standard is to ensure that the internal budgets are realistic and relate directly to how the contractor plans to accomplish the tasks. This requirement tends to frustrate many contractors who do not like to authorize any budgets internally until they have been "priced out". However, such rationale would not provide performance visibility of an unpriced change until after negotiation of that change occurs; in many cases this could be a significant length of time.

I2 Interpretation:

Last sentence of paragraph, "This requirement tends to frustrate many contractors who do not like to authorize any budgets internally until they have been priced out." **Comment:** This statement misses the mark. The problem usually involves not having clear and timely contract authorization that includes a not to exceed dollar amount or allows the contractor to use a ROM cost before the firm quote is submitted. Most contracts want a budget with new scope even more than the government. That's why some use MR as a temporary step. This issue needs to be addressed within the government circles, between the C/S office and Contracts, to improve the process which establishes/allows budget increase at the time new scope is authorized.

I7 Interpretation: O.K.

- d. If current budgets for authorized changes do not sum to the negotiated cost for the changes, does the contractor compensate for the differences by revising the undistributed budgets, management reserves, budgets established for work not yet started, or by a combination of these?

IntGd Text

When an unpriced change order is finally negotiated the contractor must reconcile the negotiated amount of that change with the amount that is currently authorized (as previously estimated budget). Adjustments must be made to liquidate any difference between these two amounts. Such reconciliation is most easily done through the use of Undistributed Budget. UB is a temporary holding account used to account for budget changes until they can be planned in detail at the cost account level. As authorized, unpriced work is received, UB is credited by the amount estimated to perform that work, and only that effort to be performed in the near term is budgeted from the UB account to the cost account. Hence when the change is negotiated the differential adjustment can be made to the amount of budget remaining in UB.

The other two alternatives for making these differential adjustments are to use Management Reserve, if it is still available or to make the change directly to the cost account budgets of work packages which have not yet begun.

I2 Interpretation:

First paragraph, second to the last sentence, "Only that effort to be performed in the near term is budgeted from the UB account to the cost account." **Comment:** Add "or the contractor may budget the full period, typically discounting the far term amount for potential scope/negotiation adjustments with this discounted amount held in UB.

I7 Interpretation: O.K.

2. RECONCILE ORIGINAL BUDGETS FOR THOSE ELEMENTS OF THE WBS IDENTIFIED AS PRICE LINE ITEMS IN THE CONTRACT, AND FOR THOSE ELEMENTS AT THE LOWEST LEVEL OF THE DOD PROJECT SUMMARY WBS, WITH CURRENT PERFORMANCE MEASUREMENT BUDGETS IN TERMS OF CHANGES TO THE AUTHORIZED WORK AND INTERNAL REPLANNING IN THE DETAIL NEEDED BY MANAGEMENT FOR EFFECTIVE CONTROL. (Reference formats 8 and 9.)

IntGd Text

The contractor's system must allow for complete traceability of all budget changes for those items that are reported to the government. This is normally accomplished by the contractor's establishment of budget control logs that record the receipt and distribution of all budget transactions with reference to the source and application of funds. Each budget and work authorization should reference a transaction number recorded in these budget control logs. Normally, subsidiary records are also maintained for each contract change to help ensure timely and complete distribution of the budget associated with each contract change. Separate records should also be kept for control of Management Reserves and Undistributed Budget.

I7 Interpretation: O.K.

CHECKLIST QUESTION:

- a. Are current budgets resulting from changes to the authorized work and/or internal replanning reconcilable to original budgets for specified reporting items?

IntGd Text

None.

I2 Interpretation: O.K.

I7 Interpretation:

There needs to be some reality put into traces back to the "original budgets" particularly when a program is very long and in cases where there has been significant amounts of customer directed changes as well as the ever popular OTB implementation.

3. PROHIBIT RETROACTIVE CHANGES TO RECORDS PERTAINING TO WORK PERFORMED THAT WILL CHANGE PREVIOUSLY REPORTED AMOUNTS FOR DIRECT COSTS, INDIRECT COSTS, OR BUDGETS, EXCEPT FOR CORRECTION OF ERRORS AND ROUTINE ACCOUNTING ADJUSTMENTS.

IntGd Text

This criterion is fairly self explanatory. The contractor may not permit records of any type of performance measurement data to be changed retroactively. Performance data is essential in reflecting contractor progress in: (1) achieving the budgetary target; (2) staying within schedule parameters; and (3) completing the scope of work to the technical specifications required in the contract. Monthly data reflects such progress; cumulative plotting of such data can be translated into performance trends. Together this monthly and cumulative data combine to provide a history of contract achievement. Any retroactive change to this mass of data will have drastic effects on the progress reports and possibly on the program. A retroactive change to monthly data will not only recall work that was previously thought to have been accomplished but will also impact the cumulative trend that was previously reflected. If ACWP and/or BCWP data is retroactively changed, the progress, payments that were previously paid to the contractor could also have been in error. Historically, the data would become unrepresentative of the actual progress.

I2 Interpretation:

The statements have a foreboding sound that makes the performance to date data seem like sacred facts. It does not recognize the possibility that errors could exist in performance data which needs corrections. Suggest a statement be included which says "Adjustments to correct errors to improve the performance to date data is allowed but must be supported and explained in the contractor's revision system and reported to the customer as appropriate. If the contractor makes adjustments frequently it may be an indication of lack of discipline or inadequate planning, which should be investigated.

I7 Interpretation:

I agree with the write-up but it should also include a caveat that these changes may be implemented with customer approval.

CHECKLIST QUESTIONS:

- a. Are retroactive changes to direct costs and indirect costs prohibited except for the correction of errors and routine accounting adjustments?

IntGd Text

Actual costs must be controlled through the contractor's general books of account and must not be altered unless for routine accounting adjustments or for the correction of errors. Adjustments made to indirect costs to account for the difference in the actual versus the applied overhead rates is an example of a normal accounting adjustment. Likewise in this same category is the adjustment of actual costs impacted by Economic

Price Adjustment Clauses (forward pricing rates for labor as an example) where the estimated rate differed from the actual rate. Included as acceptable corrections of errors are the corrections of incorrect time cards, transposition of numbers, accidentally omitted transactions, etc. All adjustments made to previously recorded costs must be well documented, including a written justification of necessity.

I2 Interpretation: O.K.

I7 Interpretation: O.K.

b. Are direct or indirect cost adjustments being accomplished according to accounting procedures acceptable to DCAA?

IntGd Text

Major contractors that do business with the Department of Defense have government auditors (normally from the Defense Contract Audit Agency (DCAA) that monitor their accounting practices on a routine basis. For the most part these auditors render opinions on whether the contractor's accounting procedures, practices, and management of indirect costs is in accordance with generally accepted accounting procedures and performed in a manner consistent with their Disclosure Statement. The handling of accounting adjustments must be described in the contractor's accounting policies and procedures and the auditor evaluates its acceptance to good accounting practices. Once they are accepted as sound policy the auditors monitors the system to ensure these procedures continue to be followed.

I2 Interpretation: O.K.

I7 Interpretation: O.K.

c. Are retroactive changes to BCWS and BCWP prohibited except for correction of errors or for normal accounting adjustments?

IntGd Text

Once the BCWS and BCWP have been reported only error-caused or normal accounting adjustments may be made to them. This practice helps to ensure that a reasonably firm Performance Measurement Baseline is maintained. In this way there is continuous and consistently credible visibility into past performance. Contractors have a tendency to want to eliminate the favorable cost variances from past performance in order to allocate the remaining (unused) budget to future effort. This tendency is usually based on the contractor not making the distinction between financial funding and C/SCSC budgeting standards. The intention of a C/SCSC budget baseline is to maintain visibility of past performance for the purpose of making projections of future performance.

If the BCWP is allowed to change for other than the correction of errors and/or accounting adjustments, then the integrity of the BCWP values become suspect. BCWP is the corner-stone of a performance measurement system and it should be based on the accomplishment of discrete tasks that are representative of true progress. The objective is to minimize any subjectivity in the BCWP calculation. Having ensured this BCWP credibility it would be extremely counter-productive to allow a retroactive adjustment to

the BCWP value.

One type of allowable routine accounting adjustment to BCWS is that required when an unpriced change order is negotiated and a differential exists between the distributed estimated budget of that change and its negotiated budget. Note: the BCWP values should not be impacted by this type adjustment, however.

I2 Interpretation:

First paragraph comment, add the following statement: "It is recognized that errors may cause the contractor to make retroactive adjustments to reflect a more meaningful performance to date. This should be infrequent and documented in his revision system and reported to the customer as appropriate."

I7 Interpretation:

I agree with the write-up but it should also include a caveat that these changes may be implemented with customer approval.

4. PREVENT REVISIONS TO THE CONTRACT BUDGET BASE EXCEPT FOR GOVERNMENT DIRECTED CHANGES TO THE CONTRACTUAL EFFORT.

IntGd Text

The Contract Budget Base (CBB) represents two things on a contract: (1) the total amount of work authorized on the contract and (2) the total amount of budget targeted to accomplish this work. When this criterion requires a prohibition against changes to the CBB it is addressing both of these facets. The contractor may not arbitrarily change the amount of work authorized on the contract and the contractor may not arbitrarily alter the amount of budget targeted to accomplish this amount of work. Only the government shall have the authority to change the CBB and this shall only be done by specific government direction through contract change notification.

I7 Interpretation: O.K.

CHECKLIST QUESTIONS:

- a. Are procedures established to prevent changes to the contract budget base (see definition) other than those by authorized contractual action?

IntGd Text

By definition of the Glossary, Chapter 2-3, in the C/SCSC Joint Implementation Guide, the CBB is "the negotiated contract cost plus the estimated cost of authorized unpriced work." The CBB increases or decreases only as a result of changes authorized by the contracting officer. For definitized changes, the CBB increases/decreases by the amount negotiated for those changes. For authorized work which has not been negotiated, the CBB increases/decreases by the amount of cost estimated by the contractor for that

effort. After negotiations, the CBB is adjusted to reflect any change resulting from the negotiations. The CBB, therefore, is a dynamic amount, changing as the authorized work under the contract changes, but it is a controlled amount, since it cannot be changed by the contractor except as a result of contracting officer actions. (Should the contractor wish to formally plan and report to a budgetary figure other than the CBB, he must have prior approval from the (government.) The contractor must have contract budget change procedures, then, that require operation to the CBB (unless otherwise specifically approved by the government) because it represents what the government officially recognizes as the authorized scope of work.

I2 Interpretation: O.K.

I7 Interpretation: O.K.

b. Is authorization of budgets in excess of the contract budget base controlled formally and done with the full knowledge and recognition of the procuring activity? Are the procedures adequate?

IntGd Text

Before the contractor can authorize budgets in excess of the CBB, he must first receive Government approval. The CBB is the amount of budget officially recognized and authorized by the government. A budget that is in excess of the CBB is called an Over-Target Baseline (OTB) which requires detailed planning known as "formal reprogramming." Formal reprogramming is required when the current contract planning is substantially unrealistic with respect to the work remaining to be accomplished. Reprogramming is a long and arduous task which the government does not wish to encourage. (It should occur no more than once, at most, during the life of a contract.) Another reason for discouraging formal reprogramming is the loss of performance visibility to the original Performance Measurement Baseline (PMB) that it causes. Baseline maintenance is paramount for performance tracking and trend analysis. The contractor must avow his intent to adhere to this philosophy in his system description and in-house policies and procedures. The procedures whereby the contractor may request reprogramming in excess of the budgets established by the CBB must be specific on how the OTB will be constructed, maintained, and used. These procedures must address the necessity for credible performance measurement after reprogramming. And they must require the full notification and approval of the government procuring activity.

I2 Interpretation:

Paragraph sentence, "Reprogramming is a long and arduous task which the government does not wish to encourage." **Comment:** This is true in looking at the past, but views are changing. Current Government and Industry thinking is that the process is valuable when conditions sighted in the paragraph exist. The process needs to be simplified and encouraged when necessary. When the contractor needs OTB it should be granted through a quick simple process. It's only purpose is to contain further cost growth which is beneficial to both the contractor and the government.

I7 Interpretation: O.K.

5. DOCUMENT INTERNALLY, CHANGES TO THE PERFORMANCE MEASUREMENT BASELINE AND, ON A TIMELY BASIS, NOTIFY THE PROCURING ACTIVITY THROUGH PRESCRIBED PROCEDURES.

IntGd Text

Since the PMB is the yardstick by which contractor progress is measured, any change to the PMB must be formally documented by the contractor organizations involved.

Further, it is paramount that any alterations of the PMB be reported to the government; this ensures that both the government and the contractor are measuring progress by the same "yardstick". The Joint Implementation Guide provides some specific guidelines by which the contractor may internally replan and thereby effect the PMB:

The contractor may not: (1) make retroactive changes to budgets, work performance, or costs of completed work; (2) transfer work of budgets independently of one another; (3) replan in-process work packages; (4) replan closed packages. The contractor may: (1) use Management Reserve to change cost account budgets of unopened work packages; (2) replan unopened work packages within the confines of cost account budgets; (3) transfer work and associated budgets between cost accounts.

I7 Interpretation:

I agree with the write-up. Remember that the PMB is reported to the government each month with the submittal of the CPR.

CHECKLIST QUESTIONS:

- a. Are changes to the performance measurement baseline made as a result of contractual redirection, formal reprogramming, internal replanning, application of undistributed budget, or the use of management reserve, properly documented and reflected in the Cost Performance Report?

IntGd Text

The PMB is the summation of the time-phased budgets (BCWS) from the cost account level. Any change to the PMB must be formally documented in the contractor's budgeting and work authorization systems by reference to the source and application of each change. At the cost account level, the contractor must be able to maintain traceability to the original budget. Changes to cost accounts must reference the authorizing change number and/or document. In addition, the Cost Performance Reports (CPRs) going to the government must detail all changes to the PMB and the effects of these changes. Specifically, format 3-The Baseline Format, must reflect any monthly/periodic BCWS changes of the PMB that have occurred since the last report; the Remarks format (Format 5) must explain in detail how these changes were effected and why; and formats 1,2, and 4 will reflect the impact of these changes on the budgets of the appropriate WBS and OBS elements and on the manpower forecast (as applicable).

I2 Interpretation: O.K.

I7 Interpretation:

I agree with the write-up but how much detail must be in the CPR is a matter of interpretation. If the changes are normal internal replanning by cost account managers to maintain a current and effective plan, they will occur every month and this level of detail reported in the CPR may be excessive.

b. Do procedures specify under what circumstances replanning of open work packages may occur, and the methods to be followed? Are these procedures adhered to?

IntGd Text

Changes to open (in-process) work packages in order to compensate for poor initial planning or significant underruns is often a temptation to contractors. In neither case shall this be allowed. Changes to open work packages must be limited to government directed changes or formal reprogramming. In other words, the contractor shall never be afforded the option of changing the budgets (or any other type of replanning) of open work packages without prior government approval. Even in an extreme situation, where the future work no longer resembles the original plan and the contractor wishes to stop the current work and issue new plans, the government's prior approval must be received before action may be taken on the in-process work packages.

In the case of mature production programs, however, where work packages may be of one or more years duration, the contractor may wish to have the option of replanning the further-term effort within the confines of the open work package. System reviewers may consider this situation for approval on an exception basis providing the contractor's procedures for such are of sufficient detail and control to prevent the cost account manager from arbitrarily using far-term budget in the near-term work-effort.

I2 Interpretation:

These paragraphs are misleading. Contractors now are being encouraged to be internal replanning to keep the baseline meaningful and realistic, which may impact open work packages. See Supplemental Guidance Item #5, dated 23 Oct '89, and d. below.

I7 Interpretation:

I do not agree with the write-up. Making the contractor seek government approval before any replanning actions which affect open work packages takes away the authority and responsibility of the contractor to manage the program. It places the government procuring agency in the role of direct, day to day, management of the details necessary to deliver a product in accordance with the contract. It places an undue burden and causes excess paperwork to be generated. This interpretation will cause managers to turn away from C/SCS and use other techniques to really manage the activity while crutching some "bean counter" system for reporting. Having a system which constrains the activity and follows interpretive guidance and the criteria should cause replanning of open work to be appropriate and controlled.

c. Are retroactive changes to budgets for completed work specifically

prohibited in an established procedure, and is this procedure adhered to?

IntGd_Text

Favorable cost variances for completed work cannot be eliminated with the "unspent budget" returned to Management Reserve or placed in work packages with unfavorable variances or some other account. And completed work packages with unfavorable variances may not have additional budget added to them. Once work is completed, the budgets cannot be changed. To do so undermines the very intent of performance measurement and destroys the credibility of any performance tracking or trend analysis that should follow. Specific attention should be given by System Reviewers to ensure that not only such "prohibition" procedures exist but that Cost Account Managers are aware of them, understand them, and adhere to them as well.

I2 Interpretation: O.K.

I7 Interpretation: O.K.

d. Are procedures in existence that control replanning of unopened work packages, and are these procedures adhered to?

IntGd_Text

It may be necessary to perform replanning actions on future, unopened work packages within the scope of authorized contract for various reasons. Among these reasons are: (1) to compensate for cost, schedule, or technical problems which have caused the original plan to become unrealistic; (2) to effect the reorganization of work or people to increase efficiency of operations; (3) to augment different engineering or manufacturing approaches than originally contemplated. Due to the importance of maintaining a valid PMB, such changes should be accomplished in a systematic and timely manner and must be carefully controlled. Many such changes can be handled within the budget and schedule constraints of the cost accounts. Other changes may require the application of Management Reserves to cost accounts to cover additional costs anticipated as a result of these changes. With regard to these situations, the contractor's written internal procedures should clearly delineate acceptable/unacceptable budget practices to include the following: (a) work responsibility should not be transferred from one cognizant organization to another, or from one cost account to another, without transferring its associated budget; (b) a budget assigned to future specific tasks should not be used to perform another task, regardless of the CWBS level involved; (c) when management reserves are used, records should clearly indicate when and where they are applied.

Replanning of unopened work packages is permissible, then, within the remaining budget and schedule constraints of the parent cost account and if the unopened work package is not scheduled to start within the period of time identified by the contractor as a "freeze period". Replanning of unopened work packages is encouraged to keep the planning realistic to the way the work is to be performed. The "freeze period" which most contractors choose to enforce, forces cost account and intermediate-level managers to look ahead at future work a little more diligently to determine if the planned start dates and the budgets are realistic.

I2 Interpretation:

This incorporates some of the intent of Supplemental Guidance Item #5 but also misses the mark. Reference to "freeze periods" are obsolete. Supplemental Guidance does not recognize "freeze periods". It gives the contractor flexibility to replan both open and unopened work packages up to the point of not making retroactive adjustments (which require prior customer approval).

I7 Interpretation: O.K.

6. PROVIDE THE CONTRACTING OFFICER AND DULY AUTHORIZED REPRESENTATIVES ACCESS TO ALL OF THE FOREGOING INFORMATION AND SUPPORTING DOCUMENTS.

IntGd Text

The government contractually requires access to all pertinent Management/Control System records in the implementation/demonstration reviews and surveillance of a contractor's performance measurement system. If the contractor does not comply with a review team or surveillance representative's reasonable request to pertinent data, the contractor is in violation of his contract with the Government. Access to data is necessary in order to assess a contractor's compliance to the C/SCSC. However, it must be noted that this criterion is to ensure data access, not necessarily physical transfer of internal records. Especially where data is claimed by the contractor to be of a "proprietary" nature, the contractor is not required to provide copies of such data to the government representatives. He must merely provide access to such data for government review/audit purposes.

I2 Interpretation: O.K.

I7 Interpretation: O.K.

CHECKLIST QUESTION:

- a. Does the contractor provide access to all pertinent records to the C/SCSC Review Team and surveillance personnel?

IntGd Text

This criterion can be exceptionally important and is usually one that is covered insufficiently in System Description. There are two basic concepts involved. The first concerns information, while the second deals with personnel authorized to obtain that information. Both concepts must be incorporated in the System Description, which normally paraphrases the criterion.

I2 Interpretation: O.K.

I7 Interpretation: O.K.

APPENDIX B

RESPONSES TO ADDITIONAL QUESTIONS

Contents to the Additional Questions	<u>Page</u>
1. What affect does the C/SCSC have on the system acquisition concept?	B-1
2. What changes, if any, do you feel should be made to the criteria or the C/SCSC discipline as employed within the DoD.	B-4
3. Do any of the criteria (or checklist questions) need to be modified or deleted? Should there be any additional ones added? Please explain.	B-7
Any additional comments/suggestions/ideas?	B-9

1. What affect does the C/SCSC have on the system acquisition concept?

G1 Comments:

The C/SCSC provides a consistent and focused methodology in organizing major acquisition programs. It provides a common source of information to permit government program managers sufficient insight into a contractor's performance and progress. It provides room for flexibility for contractors to meet their own management needs while still providing cost, schedule and technical data in a manner uniform to all government efforts.

G2 Comments:

Unfortunately, I think C/SCSC has very little affect at the contract award phase. We don't pay enough attention to how well a contractor has performed in relation to schedule and cost on prior contracts.

Contractors sometimes get measured on different terms. Contractor A is measured based on an initial contract schedule and cost baseline. Contractor B may have been authorized an "overtarget schedule" and an "overtarget baseline" and we evaluate him as to how he performed against the overt target schedule and baseline, ignoring how he performed against the initial contract schedule and baseline.

On Cost Plus type contracts, I believe we often maintain the "estimated cost negotiated CBB" but have the contractors performance look good because we delete work effort. For example, "I'll come in OK--I'll just test one less engine." Unfortunately we don't delete the budget for testing one less engine, and the contractor's performance looks pretty good.

After contract award, organization also pay too little attention to C/SCSC analysis until the contractor is in trouble--then C/SCSC becomes highly important because of its documentation. Then we "OSD" use this type of info to stab the wounded.

G3 Comments:

The criteria gives program managers confidence in the cost and schedule performance information provided on major contracts. The criteria puts more discipline in the program status provided in the CPR. If the program manager is confident in the information in the CPR, he can make more informed and timely decisions based on the data. This should improve program execution.

G5 Comments:

I believe it has great effect, however, it should have more. If we could stop making our contractors Bid in one WBS and evaluate Performance Measurement in another WBS we could really improve the return on our mutual C/SCSC investment. In today's world, no viable means exists to evaluate the BID against HISTORY without the Contractors involvement. We can't effectively determine where (and if) the BID was/is poor without running all the BID or PERFORMANCE data through a matrix that resorts it to the required WBS. This requires a level of detail (my experience is specific to BIW) that the government can't possibly bring to bear on each bid. The alternative is to employ the Contractor's assistance which limits any objectivity in the whole process. If it were a requirement, that bids be reviewed against available performance data on equivalent work, I believe that awarded contract prices would be a great deal more realistic.

I1 Comments:

The Criteria concept is based on solid foundation of Earned Value combined with promoting each contractor to find the most cost effective way to satisfy the broadly stated guidelines. Internal discipline and top management support is critical to the success of a contractor NOT ONLY maintaining compliance but to effectively utilize the structured data and data bases for communicating problems, risks, and trade-off's between the Contractor's Program Manager and the Customer's Program Manager.

Over 25 years of experience with the Criteria reveals clearly where improvements can be made to improve and streamline the mechanics of generating standardized internal and external reporting.

The "real" value and payoff is not now being realized because it is not being used effectively by the government customers and their superiors. Examples include those cited in the Inspector General Reports of the A-12, C-17, and AAWS-M among others. A change in "audit focus" from increase ratcheting and tightening of "internal procedural requirements imposed by interpretation on the Contractor" needs to be shifted to a more "top down" audit approach addressing the question of the extent to which the respective Program Managers utilize the system data to express and quantify baseline concerns, risks, and corrective action opportunities. On-going monitoring, audit and testing should be provided for to determine if the system results are being utilized in the communication of program status to government superior authorities. Determine if not, why not, and what action is required to obtain the utilization intended.

I2 Comments:

It provides a known basis on which cost performance data is generated. It's biggest plus is generating earned value which provides EAC trend data.

The Criteria and discipline needs to be reoriented to emphasize measuring quality in terms of effectiveness for management instead of tracing and checking bits of data for discrepancies.

I3 Comments:

The affect is difficult, if not impossible, to measure. If management control systems meet the intent of the C/SCSC, communication is enhanced through a common language, predictability and stability is improved through objective measurement standards, and waste is reduced through improved and more thorough planning. However, the question is, "Does imposition of the C/SCSC by the government ensure that the intent will be met?" I think not.

Many well-intentioned people have used the C/SCSC as a lever to accomplish goals other than objective performance measurement and reporting, both in the government and in the contractors' organizations. Others have interpreted the criteria too narrowly, or tried to force contractors to follow specific practices and procedures, because of ignorance of business practices in a commercial environment. While others still have been allowed to serve as Review Directors, Team Chiefs, and Team Members without the benefit of sufficient education, training, and/or experience. Each time that one of these situations occur, the affect of the C/SCSC is diminished through lack of confidence, frustration, and the feeling of excessive government control by unqualified government employees.

The affect that the C/SCSC has had on the system acquisition concept is probably a zero sum. The good that would, or should, come from the concept and intent are probably offset by poor practices by those at the point of implementation and evaluation, both in the contractor community and the government community.

I5 Comments:

I don't know what "concept" you mean ,but I'll comment on the affect of C/SCSC on system acquisition. It doesn't earn its keep. For the amount of money spent developing systems to meet the criteria; implementing the criteria; monitoring its application; and analyzing its output, it falls far short of the value it should provide the contractor and the government. And that shouldn't be taken as a knock at the criteria as much as at its implementation.

For too many years C/SCSC has been a cultists dream and a program manager's nightmare. As such, it has not been used as a management tool. It has been viewed by program management as a reporting requirement - and not a very important one! The government program offices seldom addressed the output of the systems and the contractor acted accordingly. It is only in the near past that there has been a concerted effort to address this approach to C/SCSC, by both the government and industry.

The current approach to the criteria implementation ,that is the approach that is being driven by OUSD(A) - Cost Analysis, addresses the criteria as being an aid toward implementation of a management system and views satisfactory compliance from the perspective of USEFUL and MEANINGFUL output, and reduces the role of the cultist making that role subservient to the program management role. This may cause people to view the criteria as an aid rather than a "bible", and cause the C/SCSC to have an affect on the acquisition process.

I6 Comments

The C/SCSC, if implemented and used as a management tool, cannot help but enhance the

system acquisition concept. If viewed by either the government or contractor Program Manager as just another bean-counter report, however, the C/SCSC simply adds cost to the acquisition process with no value added.

I7 Comments

The C/SCSC has tended to become a burden associated with system acquisition and has resulted in added costs for doing business. This is not as a direct result of the criteria but has evolved over time as contractors and government experts have interpreted it. If all parties turned back the pages of history and implemented the criteria as it is written, in simple straightforward, common sense terms, the imposition of criteria requirements would be able to be accomplished with a minimum of adverse impact. The bottom line is that use of the criteria must be made effective and efficient with no requirements over those absolutely needed to measure performance. In addition, levels of reporting, the frequency and types of reports must reflect value added to the management processes.:

2. What changes, if any, do you feel should be made to the criteria or the C/SCSC discipline as employed within the DoD.

G1 Comments:

Regarding how the C/SCSC discipline is employed within the DoD. I have a concern regarding contractor employees performing government oversight (C/S analysis function). Many of the C/S cost analyst positions are being contracted out. This permits "contractors watching contractors". I believe that C/S positions should be held by career government analysts. It is true that a government employee is supposed to provide oversight of the contractor employees performing the C/S function on behalf of the government, however, recently these government employees are not career government analysts but instead are recently hired contractor employees. I believe that DoD should be "building" internal C/S analysts and cost estimators.

G2 Comments:

I believe the criteria checklist items can be reduced. Too many of them are somewhat duplicative. In doing a Demonstration Review, team members have to be careful to answer only the question asked, as the rest of what they implied in the criteria checklist item is addressed later on. The criteria could be better arranged if it was more specific to a procedural concept applicable to Scheduling, Planning & Budgeting, Accounting--Actual Costs and Indirect Costs, Material, Analysis, and Revisions.

G3 Comments:

The TQ study conducted in 1991 did not result in any criteria changes. Overall industry and government felt the criteria was good. The government review teams need to be more familiar with the contractors' system terminology before reviews so we can ensure that the system being validated is really the way the contractors manage. You do not need to see BCWS, BCWP, ACWP, BAC, etc. if they are doing the same thing but call it something different. The only thing that must relate to these acronyms is the CPR itself since that is how we teach government analysts and program managers. If the IPT philosophy really works, we may see CPRs with the

contractors' terminology in the future. This would be good because we would improve communication between the government and the contractor.

G5 Comments:

Each private contractor that does work with DoD has been required to build their C/SCS around the way they personally do business. Any other approach would be inappropriate to the spirit and intent of the Criteria. However, the inevitable result is as many distinctly different systems as there are contractors. The complexity of these multiple system approaches is truly staggering. When you couple this magnitude of diversity with a select few Headquarters level reviewers, despite their obvious talents, are you really getting the best review approach?

I believe the field Administrative Contracting Offices are best equipped to evaluate Contractor Systems. They have the inside and outside track on the Contractors that they deal with on a daily basis. They are most knowledgeable in the strengths and weaknesses of their contractor's systems, and they should be vested with more control in the C/SCSC Review Environment. This would certainly require mandatory levels of training to ensure the specific system experience is well augmented with full understanding of formal requirements. This would also require a mandatory delegation and designation of field authority. No contractor can be expected to treat the local ACO with the same level of response as a Headquarters representative without clear lines of authority being drawn.

This type of change in dealing with Contractors and Field offices would be in consonance with the Total Quality approach to Management. The workers closest to the situation would be given new authorities to conduct reviews and reach resolutions of identified problems. Headquarters experts would still serve a vital role as mediators when issues proved difficult. This would streamline the review process and give local offices the necessary authority to reach speedier resolutions.

I1 Comments:

DoD and all other arms of federal procurement continue to move in the direction of supporting NSIA, other industry organizations, and individual contractors to make/promote "continuous process improvements" the existing C/SCSC so that increasing numbers of contractors will desire to adopt the Criteria and Value Earned techniques for project management in general including both commercial as well as the mandated contractual requirement from the government. For specifics, see my discussion of Summary Level VARS etc. with my critique of Section IV. Analysis Criteria.

I support the "vision" for "Earned Value Management" described by Gary Christle's five page presentation to NSIA, 1-25-94, at Houston, as well as Bob Kemps' article on Performance Analysis-Earned Value and Its Pitfalls by Robert R. Kemps, in *The Measurable News*.

I2 Comments:

See comment to question 3.

I3 Comments:

EDUCATION! The criteria are basically sound. Studies of the criteria seem to indicate that the interpretation and the implementation are the weak areas, not the criteria themselves. This

would seem to indicate a need to better educate those with the responsibility to implement systems and those responsible for reviewing those systems. The basic shortfall seems to be in the area of knowledge about the various systems and procedures needed by contractors to meet the needs of DoD (C/SCSC is only one set of requirements to be met), the Internal Revenue Service, and the Securities and Exchange Commission, just to name a few. Even in those areas unique to the C/SCSC there are frequent disagreements about intent, minimum levels of compliance, and the use of "past practices". These shortfalls cannot be overcome through one three-week course on the criteria; a more aggressive, and more comprehensive, educational approach is needed.

I5 Comments:

First, follow the lead of Cost Analysis as noted above. Eliminate from the criteria those areas that are already monitored elsewhere, e.g. accounting and overhead and material systems. Address these from the earned value perspective only and not from a system perspective. Encourage the self certification and self compliance concepts. Assure that the systems used are truly useful from a management perspective and that their output is meaningful, i.e. that the data represents the state of the program.

Also reduce all the oversight personnel to a few who understand the intent of the criteria and who know how industry does business. Discourage adversarial attitude and encourage the use of common sense and cooperation. Avoid the auditor mentality. (Incidentally, I think the "Interpretive Guide....." encourages the auditor mentality.)

I6 Comments::

Mr. Gary Christle, DoD, OUSD (A&T), recently made a presentation to the Management Systems Subcommittee of NSIA on the changes he would like to see implemented, and I think his vision is one that I can share. He envisions the creation of management systems which are self-regulating and self-correcting through focusing attention on the output product, earned value statusing, and the encouragement of contractor and government program managers to really use earned value as a tool for communicating the cost implications of technical and schedule problems, thereby integrating technical, schedule and cost performance. The objectives would be to focus on 1) integrating earned value into all discussions of technical and schedule status or problems, 2) quality and utility of reports, 3) ensuring early and comprehensive planning, 4) prevention of management system deficiencies rather than "find and fix", and 5) recognition that the quality of a contractor's management systems is determined not by the absence of defects, but by the presence of management value.

I7 Comments:

I believe that DoD needs to get its review teams up to speed with the latest in management systems in the industry. Where contractors are implementing modern systems with state of the art hardware and software, teams should not expect to review as they always have but should expect to receive a quick training course in the contractor's system and then be able to conduct a "paperless" review.

Self-certification, fewer visits and more constructive relationships between the contractors and review teams is essential. There needs to be an emphasis on both sides that reviews are not confrontational and open communication of successes and failures must be encouraged so that

effective corrective actions can be taken when a contractor is not able to demonstrate his system or to show successful subsequent application of his system.

In as much as the accounting activities are very closely scrutinized by DCAA and others and subject to their own constraints and rules, I believe it is redundant to include accounting the extent that it currently exists. I think an abbreviated accounting criteria could be included in analysis and then only addressing how costs are related to earned value at the cost account level. I believe that a single agency should be responsible for interpretation and review activities. In our experience, there is great disparity in the interpretation of the requirements between the services and even between teams from each service. If each service is to retain its individual responsibility, some much clearer guidance must be provided to the teams to preclude conflicts in what is expected of contractors.

3. Do any of the criteria (or checklist questions) need to be modified or deleted? Should there be any additional ones added? Please explain.

G1 Comments:

No additional comments.

G2 Comments:

A current project is underway to rewrite the Joint Implementation Guide and address criteria. Specifically -- some of the checklist items are too redundant. Also, the JIG does not address long lead, and NO criteria checklist asks the specific question as to at what level overhead is applied and reflected in reporting to the government. In addition, no specific checklist item asks at what level actual costs are applied.

G3 Comments:

SMC/FMC, is leading a team that is looking at all of the criteria and the checklist for a JIG update. I prefer not to comment until I see the results of that activity.

G5 Comments:

I would like to see a bit more flexibility in what constitutes adequate variance analysis. There is something inherently wrong with requiring monthly analysis when conditions have not changed since the last analysis. Leaving this to the CPR interpretation subjects the government to yet another costly change to the contract(s), and requires PMO support. As long as the Variances are well defined, explained, and all corrective actions have been accomplished, we just waste time and money requiring the rote repetition.

It would be easier to validate Contractor EACs if the C/SCSC required the use of Negotiated change rates for EAC purposes if a MOA system to document this is already in place.

I believe it would be useful to add a criterion or two on policy and procedure for developing requests to replan and/or reprogram. It would also be smart to require policy and procedure on implementing such requests after approval. There has been a need to use these techniques frequently at this site, and lack of documented development, approval, and implementation policies and procedures has made for some extra work. This could also be a platform for clearly

affirming that the Contractor's response to this are include the "no additional cost to the Government" caveat. This is suggested purely as a defense against the reluctance of PMOs to separate Performance Measurement from the funded value of the contract.

I1 Comments:

Modification is required to both criteria and checklist in the JIG (& the *Interpretative Guide*) to accommodate Integrated Product Teams (IPT) of Supplemental Guidance #4 and possibly other Supplements issued by PMJEG. Similar recognition should be considered for Summary Level VARS as well as other industry or association initiated improvements. The current rewrite of the *Joint Implementation Guide* whose draft is to be available for the PMJEG at the May 1994 meeting, will of course probably alter the checklist questions significantly.

I2 Comments:

The JIG needs a major overhaul to orient it from an auditor's view of data to management use of data. It's hoped that the JIG Rewrite going on now will move in this direction.

I3 Comments:

I would like to see the entire checklist removed and replaced with a good description of the intent behind each of the thirty-five criterion. This should be accompanied by a cross-walk, or cross-reference, to show how the criteria relate to one another. We should remove the ambiguity of the intent, and thereby enhance the understanding of the benefits of compliance. The concepts embodied within the criteria came primarily from industry, not the government, but the government has embraced them as its own. In so doing, the government has crossed the line and has used the criteria as a means to force industry to adopt practices not in anybody's best interest. The best way to combat that trend is to go back to the basics and concentrate on the intent, not the practice.

I5 Comments:

I think all of the checklist should be eliminated! Reliance on the checklist has been one of the main reasons for the slavish arbitrary approach taken to the criteria implementation. If the government review personnel need a reference guide, provide a tabular "list of things to look for during reviews".

I6 Comments:

I recently participated in Government/Industry round table discussions on rewriting the JIG and the corresponding checklist questions. The discussions were chaired by Mr. Tony Finefield, USAF/SMC/FMCL, and were attended by a government rewrite team assembled by Mr. Finefield (which includes DCMC, DCAA, and tri-service representation), and several defense contractor representatives. All comments were considered, and Mr. Finefield and his committee are currently in process of evaluating, streamlining, and modifying the JIG and the checklist. They expect to incorporate the most current management philosophy and techniques. Because the Checklist may receive the most dramatic revisions, you may find it helpful in your ongoing thesis effort to contact Mr. Finefield or his team members to get the latest information. It is my understanding that Industry will not be asked for comments until the Draft JIG is released for Government comments. I am personally hoping for some significant changes in the

guidance/philosophy regarding the performance measurement of material.

I7 Comments:

As noted above, I feel the Accounting Criteria is redundant with other oversight activities of the government. It should be greatly streamlined and incorporated into the analysis criteria.

Also under the criteria there should be some consideration given to electronic / paperless management systems and the use of electronic data interchange as a means of reporting. Where companies are using state of the art electronic systems, review teams must become computer literate and willing to accept on screen documentation.

Any additional comments/suggestions/ideas?

G1 Comments: No additional comments.

G2 Comments:

Suggest PMJEG Supplemental Guidance for C/SCSC #4 dated July 1989 be reviewed for its guidance applicable to "Guidance for Contractors Using the Work Team Concept."

Suggest PMJEG Supplemental Guidance for C/SCSC #5 dated 23 Oct 89 applicable to "Internal Replanning" including "Replanning of Work in Progress" and "Baseline Maintenance" be reviewed prior to rewriting the criteria interpretation.

I have enclosed a copy of a *Guide for Conduct of C/SCSC Demonstration Reviews and Surveillance* that was published by the Navy in June 1983. As a team chief, I have used this for many years because it is not very wordy for team members to look at and understand--when you redo the interpretation--you may want to add the "approach" guidance approach following the interpretation.

G3 Comments: No additional comments.

G5 Comments: No additional comments.

I1 Comments:

Recommend advance copies of the draft of the revised Joint Implementation Guide be widely circulated for comment through industry and selected procurement arms of DoD and other interested government agencies.

I2 Comments: No additional comments.

I3 Comments:

During the last five years, we have seen a dramatic shift in the overall approach to performance measurement demonstrated by more open communication, less evidence of adversarial relationships, and increased awareness of the potential benefits of earned value. Since we don't live in a perfect world, these improvements must be nurtured if we expect them to be continued. More cooperative ventures between government and industry (such as the national workshop)

should be considered as a means toward that end. Everybody's best interest will be better served through cooperation and understanding than through force and coercion, practices that have never been very successful in the long term.

I5 Comments:

Just a summary. Go back to the 35 criteria items without elaboration or sub-questions; provide an experienced review team for validation that will not worry about system nuances but concerns itself with system effectiveness from a program managers perspective, not an auditors; establish a self certification and self surveillance plan; and let the output speak for the effectiveness of the system. Thanks for the opportunity to comment.

I6 Comments: No additional comments.

I7 Comments:

I very much appreciate the opportunity to comment on the interpretive key. There is very little I would change in the wording as I believe it must be slanted along a more conservative line to insure that reviews are consistent and appropriately conducted. The key as well as other related pamphlets and documents should be required to be fully understood by all team members and each team member should have his or her own set of copies.

One "nit" which I must pick is that some sections seem to be quite negative in the write up. I believe that sometimes this negative flavor comes across to review teams and others who must deal with the criteria, the JIG, and the interpretive key. The vast majority of contractors want to satisfy our government customers with products and services which exceed your expectations and requirements. We also want to have effective and efficient management control systems which can tell us and you how we are performing on various programs. There is little to be served by inferring the threat of termination if EAC's grow or performance is other than perfect. When government personnel put the down side of performance measurement using the criteria ahead of real world management of programs, contractors find great difficulty in sustaining support for the criteria. I know of no contractor that wants to overrun a contract or fall off schedule as there are simply too many adverse implications from that behavior. Please try to make the interpretive wording constructive and positive in as many areas as possible.

APPENDIX C

GLOSSARY OF C/SCSC TERMS

This compilation of C/SCSC terms was compiled primarily from two sources: the *Joint Implementation Guide* (6:2-1-2-3) and *Fleming's Guide to C/SCSC* (7:501-522).

Activity: Something that occurs over time and generally consumes resources.

Actual Cost of Work Performed (ACWP): The costs actually incurred and recorded in accomplishing the work performed within a given time period.

Actual Direct Costs: Those costs specifically identified with a contract, based upon the contractor's cost identification and accumulation system as accepted by cognizant auditing representatives.

Applied Direct Costs: The actual direct costs recognized in the time period associated with the consumption of labor, material, and other direct resources without regard to their date of commitment or their date of payment. These amounts are to be charged to the appropriate work-in-progress when any of the following takes place:

1. When labor, material, and other direct resources are actually consumed.
2. When material resources are withdrawn from inventory for use.
3. Material resources are received that are uniquely identified to the contract and schedule for use within sixty days.
4. Major components or assemblies that are specifically and uniquely identified to a single serially numbered end-item are received on a line flow basis.

Apportioned Effort: Effort that by itself is not readily divisible into short span work packages, but which is related in direct proportion to some other measured effort.

At Completion Variance: The difference between budget at Completion (BAC) and Estimate at Completion (EAC). At any point in time, it represents a forecast of budget overrun or underrun.

Authorized Work: That effort which has been definitized and is on contract, plus that for which definitized contract costs have not been agreed to but for which written authorization has been received.

Baseline Review (BR): A customer review conducted to determine with a limited sampling that a contractor is continuing to use the previously accepted performance system and is properly implementing a baseline on the contract or option under review. A baseline review is particularly applicable to follow-on contracts, where key C/SCSC knowledgeable contractor personnel are retained from previous efforts.

Budget: A plan of operations for fiscal period in terms of (a) estimated costs, obligations, and expenditures; (b) source of funds for financing including anticipated reimbursements and other resources; and (c) history and workload data for the projected programs and activities.

Budget at Completion (BAC): The sum of all budgets (BCWS) allocated to the contract. It is synonymous with the term Performance Measurement Baseline (PMB).

Budgeted Cost for Work Performed (BCWP): The sum of budgets for all work packages and completed portions of open work packages, plus the appropriate portion of the budgets for level of effort and apportioned effort. Also known as "Earned Value."

Budgeted Cost for Work Scheduled (BCWS): The sum of the budgets for all work packages, planning packages, etc., scheduled to be accomplished (including in process work packages) plus the amount of level of effort and apportioned effort scheduled to be accomplished within a given time period.

Burden: Overhead expenses not conveniently chargeable directly to a specific job order, and therefore distributed over the appropriate direct labor and/or material base.

Commitment: The amount administratively reserved for future obligation against available funds based upon firm requisitions.

Contract Budget Base (CBB): The negotiated contract cost plus the estimated cost of authorized but unpriced work.

Contract Target Cost (CTC): The negotiated cost for the original definitized contract and all contractual changes which have been definitized, but excluding the estimated cost of any authorized, unpriced changes. The CTC equals the value of the BAC plus management reserve, when there is no authorized, unpriced work.

Contract Work Breakdown Structure (CWBS): The CWBS is a customer prepared family tree sub-division of a program which:

1. Subdivides an entire program into all its major hardware, software, and service elements.
2. Integrates a customer and contractor effort.

3. Provides a framework for planning, control and reporting from the lowest levels to the total contract level.

Cost Account (CA): An identified level at the natural intersection point of the work breakdown structure (WBS) and organizational breakdown structure (OBS) at which functional responsibility for work is assigned, and actual direct labor, material, and other direct costs are compared with earned value budget for management control purposes. Cost accounts are the focal point of cost/schedule control.

Cost Account Manager (CAM): A member of a functional organization responsible for task performance detailed in a cost account for managing the resources authorized to accomplish such tasks.

Cost Accounting Standards (CAS): Standards established under public law intended to achieve uniformity and consistency in cost accounting practices of government contractors.

Cost Breakdown Structure: A system for subdividing a program into (a) hardware elements and sub-elements; (b) functions and sub functions; and (c) cost categories to provide for more effective management and control of the program.

Cost Center: A subdivision of an activity or a responsibility center, for which identification of costs is desired and which is amenable to cost control through one responsible supervisor.

Cost Control: Any system of keeping costs within the bounds of budgets or standards based upon work actually performed; applicable at any level of management.

Cost Element: Typical elements of cost are : direct labor, direct material, other direct costs, and indirect costs.

Cost Incurred: A cost identified through the use of the accrued method of accounting and reporting or otherwise actually aid. Cost of direct labor, direct materials, and direct services identified with and necessary for the performance of a contract, and all properly allocated and allowable indirect costs as shown by the books of the contractor.

Cost Overrun: The amount by which a contractor exceeds the estimated costs and/or the final limitation of a contract.

Cost Performance Report (CPR): A monthly DoD report generated by the contractor to obtain cost and schedule status information for program management. The CPR is intended to provide early identification of problems having significant cost impact, effects of management actions and program status information for use in making and validating management decisions.

Cost/Schedule Control Systems Criteria (C/SCSC): Government established standards which a contractor's internal management system must meet in order to insure the government of effective planning and control of contract work.

Cost Variance (CV): The numerical difference between earned value and actual costs.

Demonstration Review (DR): The formal review of a contractor's management control system to determine whether or not it satisfies the requirements of the C/S criteria.

Design To Cost (DTC): A process utilizing unit cost goals as thresholds for managers and design parameters for engineers normally in terms of a single cumulative "average flyaway cost." This cost represents what the government has determined it can afford to pay for a unit of military equipment which meets established and measurable performance requirements at a specified production quantity and rate during a specified period of time.

Direct Costs: Those costs (labor, material, etc.) which can be reasonable and consistently related directly to service performed on a unit of work. Charged directly and finally to the contract, without distribution to an overhead unit.

Discrete Effort: Tasks which have a specific end product or end result.

Estimate at Completion (EAC): A value (expressed in dollars and/or hours) developed to represent a realistic appraisal of the final cost of tasks when accomplished. It is the sum of direct and indirect costs to date plus the estimate of costs for all authorized work remaining. The EAC = Cumulative Actuals + the Estimate-to-Completion.

Estimate-to-Completion (ETC): The value (expressed in dollar and/or hours) developed to represent a realistic appraisal of the cost of the work still required to be accomplished in completing a task.

Expenditure: A charge against available funds. It is evidenced by a voucher, claim, or other document approved by competent authority. Expenditure represents the actual payment of funds.

Extended Subsequent Application Review (ESAR): A formal review performed in lieu of a full C/SCSC demonstration review when contractor conditions have changed: (1) when programs change from *one phase to another* (2) when contractors move programs from *one facility to another* (3) when contractors make significant *changes to their C/SCSC systems description*.

External Replanning: (Government directed changes to the contract) can be in the form of a definitized change order or an unpriced change order that calls for a change in the original plan. This change most often exists as a change in the scope of the contract in terms of cost, schedule, technical parameter or a combination thereof.

Front Loading: An attempt by a contractor to provide adequate budget in the near-term budget baseline, at the expense of the far-term effort. It is an attempt to delay an acknowledgment of a potential overrun condition, in the hope that the contractor can "get well" through changes in the contract statement of work. Front loading is often the result of inadequate or unrealistic negotiated contract target costs.

Implementation Review/Visit: An initial visit by selected members of the customer C/SCSC review team to a contractor's plant, to review the contractor's plans for implementing C/SCSC on a new contract. Such visits should take place within 30 days after contract award.

Indirect Costs: Resources expended which are not directly identified to any specific product or service.

Integrated Product Team (IPT): The resultant work team of Integrated Process Development (IPD), which is a philosophy embodying the right people, in the right place, at the right time. IPT employs a multidisciplinary functional team approach to manage and integrate critical processes; thus, ensuring that the product is developed right the first time and meets the users' needs.

Internal Replanning: Replanning actions performed by the contractor for remaining effort within scope of the budget that is remaining. It is caused by a need on the part of the contractor to compensate for cost, schedule, or technical problems which have made the original plan unrealistic. The contractor is required to notify the government of all internal replanning actions.

Level of Effort (LOE): Work that does not result in a final product, e.g., liaison, coordination, follow-up, or other support activities, and which cannot be effectively associated with a definable end product process result. It is measured only in terms of resources actually consumed within a given time period.

Life Cycle Cost (LCC): The total cost to the government of acquisition and ownership of that system over its useful life. It includes the cost of development, acquisition, support, and where applicable, disposal.

Management Reserve (MR): A portion of the Contract Budget Base that is held for management control purposes by the contractor to cover the expense of unanticipated program requirements. It is not a part of the Performance Measurement Baseline.

Organizational Breakdown Structure (OBS): A functionally oriented pyramid-like structure indicating organizational relationships and used as the framework for the assignment of work responsibilities. The highest level of the OBS is the tip level of management for a weapon system. The organizational structure is progressively detailed downward to the lowest level of management. The OBS relates to the WBS in that compatible or corresponding levels of each structure normally have similar degrees of authority and work responsibility.

Over Target Baseline (OTB): A baseline which results from formal reprogramming with the approval of the customer.

Overrun: Costs incurred in excess of the contract target cost on an incentive contract, or the estimated cost on a fixed fee contract.

Performance Measurement Baseline (PMB): The time-phased budget plan against which project performance is measured. It is formed by the budgets assigned to scheduled cost accounts and the applicable indirect budgets. For future effort, not planned to the cost account level, the PMB also included budget assigned to higher level CWBS elements. The PMB equals the total allocated budget less management reserve.

Period of Performance: The time interval of contract performance that includes the effort required to achieve all significant contractual schedule milestones.

Planning Package: A logical aggregation of far term work within a cost account that can be identified and budgeted but not yet defined into work packages. Planning packages are identified during the initial baseline planning to establish the time phasing of the major activities within a cost account and the quantity of the resources required for their performance. Planning packages are placed into work packages consistent with the rolling wave concept prior to the performance of the work.

Problem Analysis Report: A report made by the responsible manager to explain a significant cost/schedule variance, its probable impact on the program, and the corrective actions taken to resolve the problem(s).

Progress Payments: Payments made to a contractor during the life of a fixed price type contract on the basis of a percentage of incurred total cost or total direct labor and material cost.

Reprogramming: A comprehensive replanning of the effort remaining in the contract resulting in a revised total allocated budget which may exceed the current contract budget base.

Responsibility Assignment Matrix (RAM): A document which defines the project organization, key individuals involved, and their responsibilities across the project. A RAM demonstrates the interrelationship of the OBS with the WBS.

Rubber Baselining: An attempt by a contractor to take far-term budget baseline and move it into the current period in an attempt to disguise current cost problems. The attempt will be to move budget without a corresponding equal amount of work tasks, to cover current cost difficulties. It is an indicator of a likely overrun condition.

Schedule Variance: The numerical difference between BCWP and BCWS.

Significant Variances: Those differences between planned and actual performance which require further review, analysis, or action. Appropriate thresholds should be established as to the magnitude of variances which will require variance analysis.

Statement of Work (SOW): A description of a product or services to be procured under a contract; a statement of requirements.

Subsequent Application Review (SAR): A visit by government personnel (and/or prime contractor and/or both) to a contractor's facility to determine whether the contractor has properly applied the management control system which had been previously accepted as meeting the requirements of C/SCSC, to a *new contract*.

Surveillance: A term used in C/SCSC to mean the monitoring of continued compliance with an approved/validated management control system.

Thresholds: Monetary, time, or resource points, placed on something, which are used as a guideline, which if breached, cause some type of management review to happen.

Total Allocated Budget (TAB): The sum of all budgets allocated to a contract. The TAB consists of the performance measurement baseline and all management reserve. The TAB will reconcile directly to the contract budget base.

Undistributed Budget (UB): Budget applicable to contract effort which has not yet been identified to CWBS elements at or below the lowest level of reporting to the government.

Variance at Completion (VAC): VAC is the algebraic difference between the BAC and the EAC.

Variance Threshold: The amount of variance beyond which a problem analysis report is required, as agreed to between the contractor and the customer. Variance parameters will differ depending on the function, level and stage of the project.

Work Breakdown Structure (WBS): The WBS is a product-oriented family tree division of hardware, software, services and program unique tasks which organizes, defines, and graphically displays the product to be produced, as well as the work to be accomplished to achieve the specified product.

Work Package Budgets: Resources which are formally assigned by the contractor to accomplish a work package, expressed in dollars, hours, standards or other definitive units.

Work Packages: Detailed short-span jobs, or material items, identified by the contractor for accomplishing work required to complete a contract.

APPENDIX D

SAMPLE JIG CHECKLIST PAGE

AFSC/AFCC/AFLC-P173-5 AMC-P 715-5 NAVSO-P3627 DLAH 8400.2 DCAA-P7641.47

Appendix E-continued

CHECKLIST ITEMS	YES	NO	REMARKS
2. IDENTIFY ON A MONTHLY BASIS, IN THE DETAIL NEEDED BY MANAGEMENT FOR EFFECTIVE CONTROL, BUDGETED INDIRECT COSTS, ACTUAL INDIRECT COSTS, AND VARIANCES, ALONG WITH THE REASONS. (Reference format 7.)			
a. Are the variances between budgeted and actual indirect costs identified and analyzed at the level of assigned responsibility for their control (indirect pool, department, etc.)?			
b. Does the contractor's cost control system provide for capability to identify the existence and causes of cost variances resulting from--			
(1) Incurrence of actual indirect costs in excess of budgets, by elements of expense?			
(2) Changes in the direct base to which overhead costs are allocated?			
c. Are management actions taken to reduce indirect costs when there are significant adverse variances?			
3. SUMMARIZE THE DATA ELEMENTS AND ASSOCIATED VARIANCES LISTED IN ITEMS 1 AND 2 ABOVE THROUGH THE CONTRACTOR ORGANIZATION AND WBS TO THE REPORTING LEVEL SPECIFIED IN THE CONTRACT. (Reference formats 2, 3, 4, 5.)			
a. Are data elements (BCWS, BCWP, and ACWP) progressively summarized from the detail level to the contract level through the CWBS? (Provide exhibit.)			
b. Are data elements summarized through the functional organizational structure for progressively higher levels of management? (provide exhibit.)			
c. Are data elements recognizable between internal summary reports and reports forwarded to the Government?			
d. Are procedures for variance analysis documented and consistently applied at the cost account level and selected WBS and organizational levels at least monthly as a routine task? (Provide examples.)			
4. IDENTIFY ON A MONTHLY BASIS SIGNIFICANT DIFFERENCES BETWEEN PLANNED AND ACTUAL SCHEDULE ACCOMPLISHMENT TOGETHER WITH THE REASONS.			
a. Does the scheduling system identify in a timely manner the status of work? (Provide representative examples.)			

APPENDIX E

RESEARCH PACKAGE COVER LETTER

FROM: LSQ

19 January 1994

SUBJECT: C/SCSC Interpretation Research

TO: Distribution List QHW

1. In an effort to reduce differences in the interpretation of the Cost/Schedule Control Systems Criteria (C/SCSC), we are requesting your assistance. We would like you to provide feedback for an ongoing thesis effort at the Air Force Institute of Technology (AFIT). The thesis objective is to identify C/SCSC interpretative differences. Results of the thesis will be used to update the AFIT publication, *The Interpretive Guide to the Evaluation/Demonstration Review Checklist for C/SCSC (Appendix E, Joint Implementation Guide)*, which is a teaching aid in the C/SCSC field.
2. Enclosed is a copy of the Interpretive Guide. We ask you to please review the assigned section(s) (see Atch 1) of the *Guide* and provide comments of how your understanding and interpretation of the criteria are different or the same. Your comments are very important so that we may get a better understanding of how the professionals in the C/SCSC field interpret the criteria. Again, we ask you to focus your responses toward the designated section of the criteria. However, please feel free to comment on any of the criteria in which you have experience and would like to contribute to.
3. Also enclosed is a diskette with word processor files of the five different criteria sections from the *Interpretive Guide*. These files are to help you provide responses to the criteria and checklist questions and will also aid in our data collection and analysis effort. Please use these files on the diskette to provide your input. When completed, please return the diskette (with your comments included in the files) and Attachment 1 NLT 31 March 1994.
4. This study is being conducted across the entire DoD, as well as with members of the National Security Industrial Association (NSIA) Management Systems Subcommittee. We are trying to identify differences and similarities within and between the DoD and its contractors. We hope to increase the awareness of the differences and the accepted interpretations across the C/SCSC communities, which will hopefully lead to fewer problems and discrepancies of contractors' C/SCSC systems during government reviews.
5. This spring we plan on hosting a forum for DoD and NSIA members to discuss the results of this study and provide an open opportunity for communication. Further details and invitations will be forwarded at a later date to all of the respondents of this study.
6. Thank you for your assistance in providing your interpretative approach. We promise non-attribution and to keep the anonymity of all respondents of this study. If you have any questions, please feel free to contact either Capt Brian Hoffmann or Capt Johnny Wilson:

	DSN	Commercial	Email (via internet)
Capt Hoffmann	785-7777 x2213	513-255-7777 x2213	bhoffman@afit.af.mil
Capt Wilson	785-7777 x2402	513-255-7777 x2402	jwilson@afit.af.mil

//signed//
R.C. ANTOLINI
Faculty

1 Attachment
1. Information Sheet

APPENDIX F

RESEARCH PACKAGE INSTRUCTIONS

C/SCSC Interpretation Study Information Sheet

Please complete and return this sheet along with the diskette and edited files by 31 MAR 94 to:

Richard C. Antolini, AFIT/LSQ, 2950 P Street, WPAFB OH 45433-7765

Primary section: _____	Secondary section: _____
------------------------	--------------------------

Name _____	Phone # <input checked="" type="checkbox"/> Commercial _____
Address <input checked="" type="checkbox"/>	Phone # <input checked="" type="checkbox"/> DSN (if applicable) _____
_____	Fax # — Commercial _____
_____	Fax # — DSN (if applicable) _____
Branch of Service or Company Name _____	Position/Job Title _____

The diskette and its files

- The enclosed diskette contains a number of files which will help you in documenting your comments. There are five primary files formatted for various different word processors. Each of the primary files contain criteria and checklist questions from the corresponding sections of the *Interpretive Guide*. For instance, if you were asked to provide comments on the Accounting Criteria, you would use the PART_3 file that corresponds to your word processor. The primary files and their subjects are listed below:

File #	Subject
PART_1	Organization
PART_2	Planning and Budgeting
PART_3	Accounting Criteria
PART_4	Analysis Criteria
PART_5	Revisions and Access to Data

- Although the diskette does not contain software files from all of the popular word processors, it should contain a format that is compatible with yours. Formats included on the diskette are Microsoft Word 2.0 for Windows, Microsoft Word 5.0 for the Macintosh, and WordPerfect 5.1 for DOS. Two additional generic formats are also included, Rich Text Format (RTF) for other Windows or Microsoft applications and the plain text format (TXT) if all else fails.

Each of the formats has its unique file extension which makes it easy to distinguish the different formats. Files of a specific format are stored in individual subdirectories on the diskette. The table on the next page displays the subdirectories and recommends the types of files to try and open with your word processor. One type may work better than another, so you may want to try several suggestions if applicable.

Please continue with the next page.

If your word processor is one of the below:	Try this	.RTF	.TXT	.DOC	.WPS	.MCW
	Subdirectory	Rich Text Format	Simple text files	Word for Windows 2.0	WordPerfect 5.1	Word for Mac 5.0
Word for Windows				X		
Word for Mac		First				Second
WordPerfect 5.1					X	
WordPerfect 6.0		First		Second	Third	
AmiPro 2.0, Windows		First		Second		
Other Windows' apps		First	Third	Second		
Other DOS applications			Second		First	

Using the files to provide responses

□ Each file (for example, PART_3.DOC) is formatted so that you may easily provide your interpretations and comments for any criterion and its checklist questions. The files follow the same general format as the *Interpretative Guide*, without the "intent" that the *Guide* provides. Each file has places for your comments; the paragraphs that simply say "Interpretation:" are those place holders. We suggest you place your text insertion point at the end of that paragraph/line and then begin typing to add your comments and ideas.

You may want to cross reference the *Interpretive Guide* (hardcopy included) if you need a "mind-tickler" for the specific area you are commenting on. Please remember, it is your interpretation of the criterion/checklist question which we are interested in.

Additional questions

In addition to the comments you provide on the criteria, we would like to know what you think about the three questions below. To assist in providing your comments, we have included these questions in a file saved in the above word processor formats. It is called QUESTION.XXX and is located on the diskette in the same locations as specified by the table above.

1. What affect does the C/SCSC have on the system acquisition concept?
2. What changes, if any, do you feel should be made to the criteria or the C/SCSC discipline as employed within the DoD?
3. Do any of the criterion (or checklist questions) need to be modified or deleted? Should there be any additional ones added? Please explain.

Saving the files for return to AFIT

□ When working on any file, you may save your work by choosing the most natural method known by your word processor — in other words, whatever it suggests you save it as. However, please follow the guidelines below to save the file in its final format, to be placed on the diskette for its return back to AFIT.

Save the final version of a file to the diskette by using your word processor software **save as** capability to save it in one of the formats below. The formats are listed in decreasing order of preference, so please try the top method before trying the next method, working your way down.

- ① Microsoft Word 2.0 for Windows
- ② Rich Text Format (RTF)
- ③ WordPerfect 5.1
- ④ Text only (TXT)

? Any questions? Please feel free to call either Captains Brian Hoffmann (x2213) or Johnny Wilson (x2402) at 513.255.7777 or DSN 785.7777. Although this phone number is voice mail, we will get back to you as quickly as we can to discuss anything you wish concerning this effort. Thank you once again for your effort, patience, and time.

APPENDIX G

ACKNOWLEDGMENTS OF PARTICIPANTS

The following list of names are people who have participated in this research effort. Some were respondents to the research packages, some shared valuable information over the phone, and others supported the research in additional ways.

U.S. Government Participants

<u>Name</u>	<u>Department</u>
Shirley Ark	Air Force
Joy Collins	Air Force
Tony Finefield	Air Force
Bill Harper	Air Force
Larry Kumitis	Navy
Pat Quinn	Air Force
Charles Sell	Navy
Gerald Simms	Air Force
Gayla Teague	Navy

Industry Participants

<u>Name</u>	<u>Company</u>
Arthur Anderson	Texas Instruments
Don Campbell	Northrop Corporation
Bob Higbee	Loral, Western Development Labs
Jim Levins	TRW Corporation
Michael Martin	Pratt & Whitney Corporation
Nancy Mehrmann	Loral Aeronutronic
John Pakiz	McDonnell Douglas Aerospace-West
Paul Soloman	Northrop Corporation
Dennis White	ARIST Corporation

BIBLIOGRAPHY

1. Blackburn, D. R. Briefing Handout, "Performance Measurement System Review Survey." Presented to the Second Annual Air Force Space Division/Industry C/SCSC Workshop, 9 August 1988.
2. Christensen, David S. "Management Control Systems Theory is Useful Tool," *Program Manager*, 18: 20-23 (November-December 1989).
3. Christie, John and Wallace H. Robinson, Jr. Joint DoD/Industry Total Quality Management Team Report for Program Management on the Cost/Schedule Management Process, 17 May 1991. Department of Defense and the National Security Industrial Association.
4. Cost/Schedule Systems Compendium. Report prepared by The National Security Industrial Association Management Systems Subcommittee. NSIA National Headquarters, Washington DC, September 1980.
5. *Defense Acquisition Management Policies and Procedures*, DoDI 5000.2, 21 February 1991.
6. Departments of the Air Force, the Army, the Navy, the Defense Logistics Agency, and the Defense Contract Audit Agency. *Cost/Schedule Control Systems Criteria: Joint Implementation Guide*. Washington DC: Government Printing Office, 10 October 1987.
7. Fleming, Quentin W. *Cost/Schedule Control Systems Criteria: The Management Guide to C/SCSC*. Chicago: Probus Publishing Company, 1988.
8. Gradeken, Owen C. and Thomas S. Tison, "The Cost of C/SCSC," *Program Manager*, 12: 13-18 (July-August 1983).
9. Interpretive Guide to the Evaluation/Demonstration Review Checklist for C/SCSC (Appendix E, Joint Implementation Guide). Class handout, SYS 362, Cost/Schedule Control Systems Criteria. Department of Quantitative Management, School of Systems and Logistics, Air Force Institute of Technology, Wright-Patterson AFB OH, December 1993.
10. Office of the Inspector General, Department of Defense. *Use of Contractor Cost and Schedule System Data*. Report Number 93-067. Washington: Government Printing Office, 11 March 1993.

11. Robertson, David. Class presentation, SYS 362, Cost/Schedule Control Systems Criteria. Department of Quantitative Management, School of Systems and Logistics, Air Force Institute of Technology, Wright-Patterson AFB OH, 30 September 1993.
12. Slemaker, Chuck M. *The Principles and Practice of Cost / Schedule Control Systems*. Princeton: Petrocelli Books, 1985.
13. Webster, Anthony. "C/SCSC Lessons Learned: Theoretical Framework," *Program Manager*, 17: 13-22 (July-August 1988).

VITAE

Brian Hoffmann was born in Pittsburgh, PA, on 18 October 1966. He graduated from Penn Hills Senior High School in 1984 and then attended the University of Pittsburgh and graduated with a Bachelors degree in Physics. Captain Hoffmann was an AFROTC cadet at Pitt and received his commission 14 May 1988, following graduation from the University. His first assignment was at Headquarters, Air Force Logistics Command, Wright-Patterson AFB, working as a logistics operations research analyst for the Materiel Management Directorate, focusing his analysis in consumable item management. In the summer of 1990 he began a new job as an artificial intelligence project officer in the Acquisition Logistics Division. It was here where he began a new "information revolution" within the Air Force by developing a software application using commercial off-the-shelf text-retrieval software. His experience in personal computer software development led him to his next challenge in November 1991 where he participated in software projects for the Air Force Acquisition Model. During the summer of 1993 he became a full-time student in the Graduate Systems Management Program at AFIT. He graduated in September 1994 and then moved to Texas for his next assignment at the Human System Center, Brooks AFB.

Permanent Address: 412 Springdale Drive
Pittsburgh, PA 15235

Captain Johnny Wilson was born on October 6, 1961 in Columbus, Mississippi. He graduated in 1979 from Robert S. Caldewell High School. He attended Mississippi State University graduating in May 1984 with a Bachelor's of Professional Accountancy (BPA) degree. He also received a Master's Professional Accountancy (MPA) degree from Mississippi State in August 1985. Capt Wilson received his commission through AFROTC and entered active duty as a cost and management analysis officer at Columbus AFB, MS in October 1985. In January 1989 Capt Wilson transferred to Wright-Patterson AFB, OH and became chief of the Cost Office at the Air Force Institute of Technology (AFIT). In December 1990, he transferred to the B-2 Systems Program Office (SPO) and became a program analysis officer. He later became the financial manager for the Training Systems Integrated Product Team in the B-2 SPO. Capt Wilson entered the AFIT graduate cost analysis program in May 1993. Upon graduation he will be assigned to the Air Force Cost Analysis Agency in Alexandria, VA as a cost analyst. He is married to Tracie Rhodes-Wilson of Springfield, OH.

Permanent Address: 6484 Manete Street
Springfield, OH 45502

REPORT DOCUMENTATION PAGE

**Form Approved
OMB No. 0704-0188**

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)			2. REPORT DATE September 1994		3. REPORT TYPE AND DATES COVERED Master's Thesis	
4. TITLE AND SUBTITLE COST/SCHEDULE CONTROL SYSTEMS CRITERIA INTERPRETATION DIFFERENCES BETWEEN THE DOD AND ITS CONTRACTORS			5. FUNDING NUMBERS			
6. AUTHOR(S) Brian E. Hoffmann II, Captain USAF Johnny Wilson, Captain USAF			8. PERFORMING ORGANIZATION REPORT NUMBER AFIT/GSM/LAS/94-S-6			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air Force Institute of Technology, WPAFB OH 45433-6583			10. SPONSORING / MONITORING AGENCY REPORT NUMBER			
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) OUSD(A): AP&PI/PM Room 3E1025: The Pentagon Washington DC 20360-5000			11. SUPPLEMENTARY NOTES			
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution unlimited				12b. DISTRIBUTION CODE		
13. ABSTRACT (Maximum 200 words) This study attempted to identify the major interpretive differences of the Cost/Schedule Control Systems Criteria (C/SCSC) between Department of Defense (DoD) and contractor performance management professionals, and to understand why these differences occurred. As the study progressed, its focus shifted to an evaluation of the <i>Interpretive Guide</i> , an Air Force Institute of Technology (AFIT) published document used to assist in the understanding of the criteria elements. The objective of the evaluation was to determine if the <i>Interpretive Guide</i> 's explanations of the criteria elements were in consonance with the intent of the criteria and with current practice in the field of performance management. Research packages were distributed to and collected from performance management professionals in the DoD and its contractors. No distinct interpretative differences of the criteria were found between the two groups but a number of suggestions to improve the content of the <i>Interpretive Guide</i> were suggested; some of the recurring suggestions were to address the concept of integrated product teams and the development of procedures to streamline the area of variance analysis reporting. Respondents comments were published in an appendix and summarized within the text. Recommendations were to update the <i>Interpretive Guide</i> as well as to perform further research.						15. NUMBER OF PAGES 237
14. SUBJECT TERMS Cost/Schedule Control Systems Criteria, C/SCSC, Education, Performance Management, Performance Measurement, AFIT, DOD, Contractors, Industry, Interpretive Guide, NSIA						16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified		18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified		19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified		20. LIMITATION OF ABSTRACT UL